



A publication of the VIRGINIA NATIVE PLANT SOCIETY

<http://www.vnps.org>

Conserving wild flowers and wild places

# Hybrid oaks: Full of vexation and wonder

Distinguishing different species of oak in the forests of eastern North America can be challenging. For one thing, there are simply a lot of different species to sort out. A recent reference (Stein et al. 2003), describes 50 species in the genus *Quercus* occurring naturally east of the 100th meridian, and 90 species are distinguished for all of North America north of Mexico (Nixon 1997). With so many species to parse, confident identification requires careful study of leaves, stem and leaf hairiness, and fully mature acorns with their caps. But care is not always enough, because in addition to the identification challenges inherent in any species-rich group, many oaks hybridize

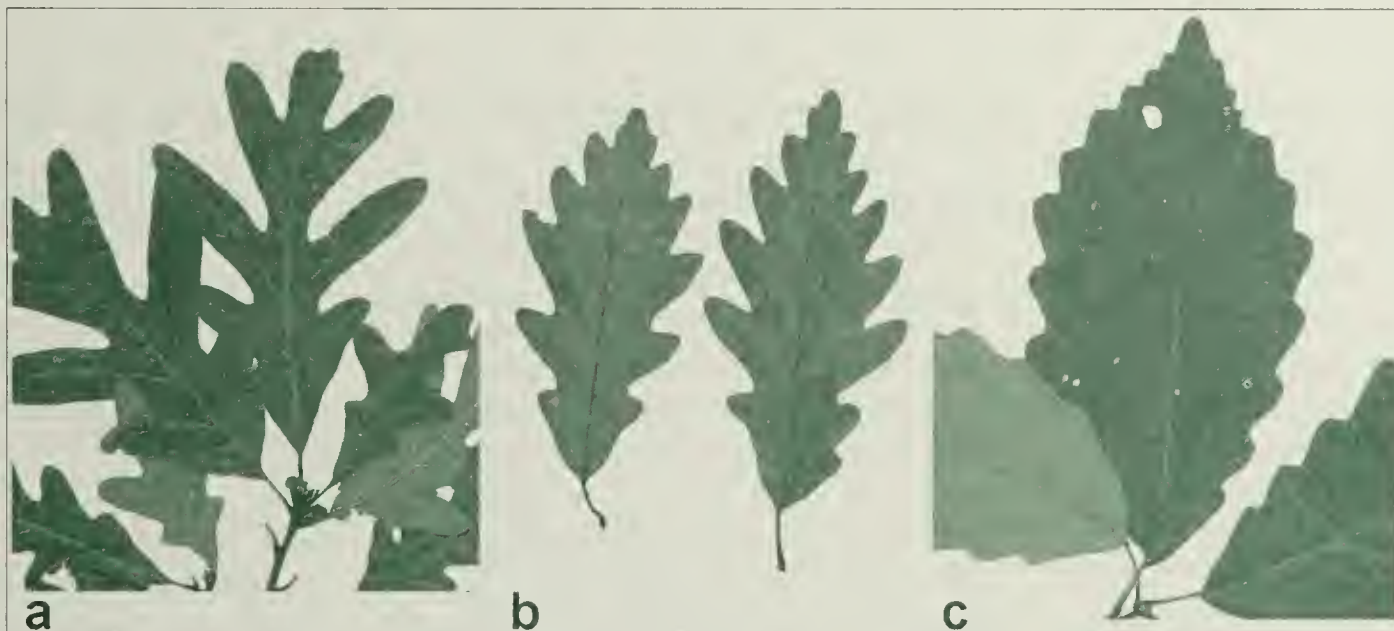
with closely related species, and hybrids, by their nature, blur what should be clear-cut distinctions between species.

Hybrids parented by the VNPS Wildflower of the Year for 2011, white oak (*Quercus alba*), offer a case in point. White oak is known to hybridize naturally with post oak (*Q. stellata*), overcup oak (*Q. lyrata*), bur oak (*Q. macrocarpa*), chestnut oak (*Q. montana*), chinkapin oak (*Q. muehlenbergii*), dwarf chinkapin oak

(*Q. prinoides*), swamp white oak (*Q. bicolor*), and swamp chestnut oak (*Q. michauxii*). Further, given the opportunity in gardens and arboreta, our native white oak will hybridize with the English white oak (*Q. robur*). Reproductive promiscuity is not unique to white oak; post oak will also form hybrids with most of the species known to cross with white oak, and most of those species can parent multiple hybrid lineages as well. Many of these hybrids have been given formal scientific names. (Up-to-date listings in Nixon, K.C. 1997. 5. *Quercus* Linnaeus. *Flora of North America, North of Mexico* 3: 445-447.)

As one might expect, hybrid oaks blend the characters of

(See Hybridizing, page 6)



One example of hybridization among species of the white oak group; a. white oak, *Quercus alba*; b. hybrid oak, *Q. x saulei* (= *Q. alba* x *montana*); c. chestnut oak, *Q. montana*.

The Green  
Swamp

See nature's botanical wonders in  
North Carolina & Kansas!

Sign up for VNPS Field Trips now. . . Page 2

Tallgrass  
Prairies





## From the president . . . . .

### *Watch for buds bursting, figuratively and literally*

*Hello Friends,*

*First an update: Some months ago we reported here that VNPS had joined the*

*Maryland NPS and an individual in a complaint against the National Park Service opposing a transfer of 15 acres of land from Fort Dupont Park, one of the Circle Parks, to the District of Columbia. Washington, D.C., was going to allow expansion and new construction of sports facilities by a private group. The land was adjacent to an upland gravel terrace forest, a type that is being lost to development in Northern Virginia. We opposed the transfer of Park Service lands in general, but were especially concerned over the likely effects of the construction on the forest. The suit asked for a full Environmental Impact Statement rather than the Environmental Assessment that had been conducted, which had failed to consider impacts on the forest. After negotiations that set certain transfer terms, the suit was discontinued. The terms commit the District to develop and maintain the new facilities so as to minimize impact on the forest. The buildings will meet LEED (Leadership in Energy and Environmental Design) standards and the D.C. Green Building*

*Act. Public access is guaranteed. All projects will be subject to review by the National Capital Planning Commission, which will allow for input into mitigation measures to protect the forest. As Kirsten Johnson, President of MNPS, stated in her article (Marilana, Fall 2010), "Our ongoing study of the areas turns out to mean a lot more than simply some fun Sunday outings."*

*If you want to get to know your forests better, lots of our chapters have tree ID walks this time of year. Learning shape, bark, and buds can be very interesting, and you get to see where all the bird nests were, just which plants stay green underneath them, and what pops up first in spring. I've been watching a few native columbines (*Aquilegia canadensis*) that inhabit a tiny limestone outcrop behind my house for Project Budburst, and in mid-January after several snows and lots of freezing weather they are just now giving up and starting to wither! Project Budburst is a nationwide program that follows the phenology, or study of cyclical and seasonal phenomena in nature, of a selected group of plants. You can join in at their website—just search for Project BudBurst online.*

*Looking forward to buds bursting!*

**Your President, Sally Anderson**

## *Visit Carolina's Green Swamp or the Kansas tallgrass prairie with VNPS*

### **June 4-5 Green Swamp Tour**

The Green Swamp, once estimated to cover 200,000 acres, is located in southeast North Carolina. It is known for its combination of longleaf pine/wiregrass savannas and pocosins (wetlands) and is considered one of the richest areas botanically along the Atlantic Coast. The Green Swamp is home to at least 14 species of native carnivorous plants, among which is the rare Venus flytrap, *Dionaea muscipula*, which blooms in early June. It is also home to many species of native orchids and rare animals, one of which is the endangered red-cockaded woodpecker.

The tour will encompass several locations in the Green Swamp area including the Nature Conservancy's

Green Swamp Preserve and the Nature Conservancy-managed Boiling Springs Lakes Preserve. David McAdoo, a member of the North Carolina Native Plant Society and co-founder and past president of the Native Orchid Conference, Inc., will be the guide.

Two fishing cottages along the shores of one of the largest Carolina bay lakes have been reserved for lodging. They will be available from Friday afternoon, June 3, until Monday morning, June 6. Rooms will be double or triple occupancy depending on the number of participants. A full kitchen in each cottage will be available for use.

The cost of the tour is \$125, which includes three nights' lodging, field trips, and fees, and lunches in

the field. Participants are responsible for all other meals and transportation to North Carolina. Transportation while on the tour will be by carpool.

For this tour, reservations and a \$50 deposit are needed by April 1, and full payment is due by May 1.

### **June 11-18 Kansas Prairie Tour**

The Kansas Prairie Tour will visit tallgrass prairies from eastern Kansas, where the rare Mead's milkweed, *Asclepias meadii*, can be found in prairie remnants, to a natural wetland in the Smoky Hills of central Kansas. The majority of the tour will be centered in the Flint Hills region of Kansas where most of the remaining undisturbed tallgrass prairies can be

*(See Sign up, page 5)*



# Blacksburg art students give to Flora of Virginia Project

Students at Blacksburg High School recently donated \$161 to the Flora of Virginia Project in what we think is the first gift to the Flora Project by school students. More interesting still is how the students raised the funds for this gift: they held a bake and art sale, but with a difference. The art—and the baked goods—had the theme of native Virginia plants.

Lou Greiner, a nature sculptor and a member of the Blue Ridge Wild Flower Society, was slated for an exhibition of her miniatures in November and December at the Montgomery Museum in Christiansburg. To coincide with the show, she offered two workshops to art classes at the Blacksburg school and at nearby Christiansburg High School.

At Blacksburg, she worked with art teacher Jessica Pace-Berkeley to design a workshop in which advanced beginners learned to sculpt native plants using a polymer clay similar to the medium Greiner uses in her work. They were encouraged to insert, as Greiner does, an animal into the plant sculpture—"botanicals and critters," Pace-Berkeley called it. Christiansburg students worked in scientific illustration.

Greiner spoke with Sally Anderson, VNPS president, who provided flyers on the Flora Project, and, using field guides, students learned about the importance of native plants. Pace-Berkeley encouraged the students to sketch before they embarked on the sculpting.

"Native plants were emphasized, but it wasn't easy to stick to natives at that time of year, so some cultivars were used as well. And for the most part, they used their drawings," Greiner said. She demonstrated the clay technique creating trillium, "mainly because it's 3, 3, and 3, very simple. I told them they could use their drawings and do the flower they had researched, or they could use the trillium."

Students made sculptures in parts. "We used a low-temperature clay, so it didn't need to be fired in a kiln," said Greiner. "I'd oven-cure it and take it back to them, and they'd paint and glaze it. It was one of the best workshops I've done in a long time."

"My only requirement was that it have a base, a stem, a leaf, a flower, and a critter," said Pace-Berkeley. In addition to trillium, plants included the morning glory, buttercups, dogwood, and sunflower, provided with birds, the praying mantis, or ladybugs.

"Coming here after school and during lunch, they couldn't work on these projects enough," she said. "We also made art cakes and pies and brownies and muffins, made them floral in design." A *Helianthus* cake proved especially palatable. "One girl took Oreos and made them the centers in the sunflower paintings by Van Gogh, and someone else used textured icing to re-create the cypress trees in



*A trillium sculpted by an art student at Blacksburg High School, using polymer clay. The sale of these and other works, including botanical cakes, raised money for the Flora of Virginia Project.*

*The Starry Night*," another Van Gogh.

For the opening, on Nov. 5, the students' gallery was created in the museum's library. "Sue Farrar, executive director, hung all the drawings she could from both classes," said Greiner, "and the sculptures were displayed on a large table."

"The students went to the opening reception, and now they've been in a museum, and that's a good thing for high school students," Pace-Berkeley said. "People came up to me and talked about the Flora of Virginia Project, because most of them had never heard about it before." Flyers on the Flora Project were available at the show as well, "so that people could understand why the student work was there," Greiner said.

Recognized regionally and nationally, Greiner was artist-in-residence at Georgia's Callaway Gardens in the spring of 2006. In 2007, the Smithsonian Institution commissioned her to do three botanicals, which have now been installed in its National Museum of Natural History.

"I personally think, I told Jessie, that the reason I came up with this was a) it totally ties in with what I do and b) if it weren't for someone protecting and documenting things like this, I wouldn't have subjects!" Greiner said. "I feel like it's so crucial for anyone doing wildlife and botanicals to recognize that," she added.

*Bland Crowder, associate director,*

*Flora of Virginia Project*

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## Don't miss these upcoming native plant events

**Saturday, March 26, 10 a.m.-1 p.m., Arcadia Field Trip** (Blue Ridge Wildflower Society). Search for early spring ephemerals such as bloodroot, bird's foot violet, and toothwort. Bring a drink and snack. Easy walking. Meet at Bojangles restaurant in Daleville and carpool. Contact Rich Crites 540-774-4518.

**Sunday, March 27, 10-2 p.m., Garlic Mustard Pull** (Piedmont Chapter) at Marjorie Arundel Trillium Trail, a VNPS registry site at G.R. Thompson WMA in Linden. Come for any time period to help eradicate garlic mustard. IT IS HELPING! If you plan to spend the day, pack a lunch. The first 15 participants will receive a complimentary wine tasting voucher from Fox Meadow Winery. For information, contact Richard

Stromberg at 540-631-0212 or risy@embarqmail.com.

**Monday, March 28, 7-8:30 p.m., Blue Ridge Wildflower Society meeting**, "Cooking with Native Plants" by Smith Mountain Lake chef Mark Crim. Demonstration and sampling. Roanoke Church of Christ, 2606 Brandon Ave. Contact Rich Crites 540-774-4518.

**Saturday, April 9, Blacks Run cleanup, Harrisonburg, (Shenandoah Chapter)**, Barbara McSweeney at 540-363-1116 or barbmcs@newhopetel.net

**Sunday, April 10, meet at 9 a.m., Second Sunday Walk, U.S. National Arboretum** (Piedmont Chapter), Join Carrie Blair for a walk through this living museum. Par-

(See Events, page 8)



# Harperella

## Working to bring a plant back from the brink



Monitoring a test plot.

*Ptilimnium nodosum* (harperella) is a federally endangered emergent aquatic plant with 13 remaining populations in the eastern United States—down from 26 in 1988—with only one natural occurrence in North Carolina, on the Tar River. Historically two additional populations were located along the Deep River in North Carolina, but because of severe population decline, in 1997 North Carolina Botanical Garden (NCBG) staff rescued the eight remaining individuals from one of these populations for ex situ propagation at the garden. The second population went extinct.

The fact that the NCBG as part of the Center for Plant Conservation (CPC) partnership is working hard to bring harperella back from the brink of extinction is directly due to the \$10,000 VNPS sponsorship of the rare *Ptilimnium nodosum*. That amount was set forth in the VNPS November 2004 fundraising letter as what was needed to sponsor the plant. Only one population of harperella is known to exist in Virginia. By early 2005, VNPS members had met and exceeded the goal by \$800. The additional amount was put toward efforts to save Kentucky ladyslipper.

The mission of the Center for Plant Conservation is to conserve and restore the imperiled native plants of the United States in order to secure them from extinction. The CPC is a network of

Species Name: *Ptilimnium nodosum*

Common Name: Harperella

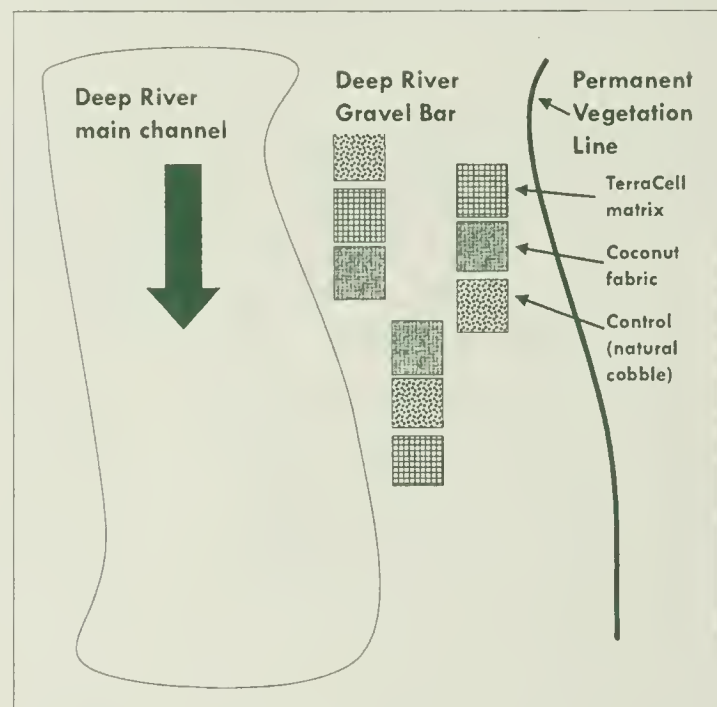
Family: Apiaceae

Reintroduction Initiated: 2006

Location: North Carolina

Length of Monitoring: 2006-present (ongoing)

Factors Tested: Streambed stabilization materials



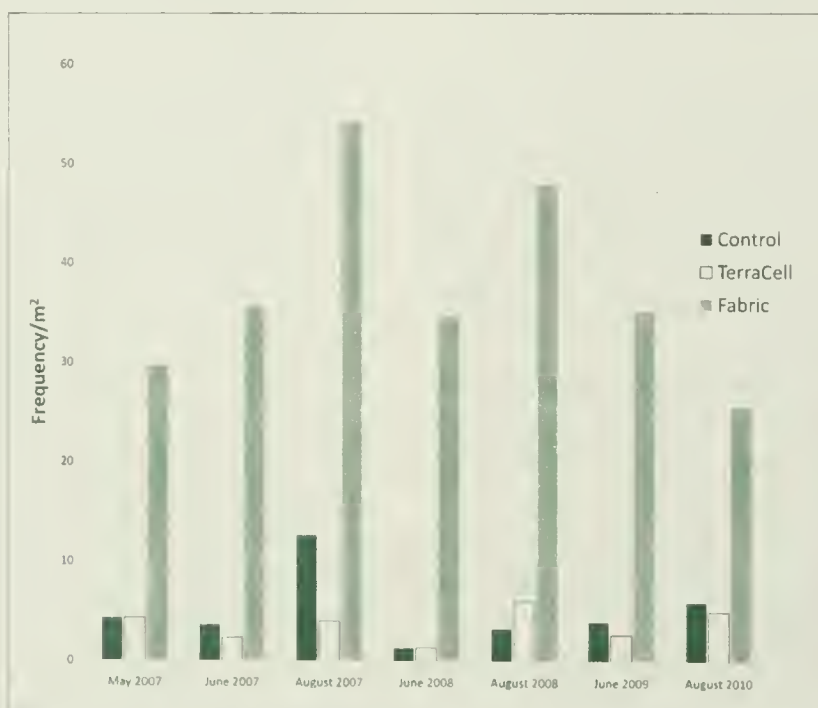
Planting diagram for *Ptilimnium nodosum* reintroduction that shows the positioning of each plot and within plot treatments with 70 plants in each plot per treatment (TerraCell®, coconut fabric, and natural cobble).

36 leading botanic institutions including the NCBG. Founded in 1984, the center operates the only coordinated national program of off-site (ex situ) conservation of rare plant material. This conservation collection ensures that material is available for restoration and recovery efforts for these species. CPC also works in research, restoration, technical assistance, education and advocacy through the efforts of the network and the national office.

The purpose of the NCBG project was to create a self-sustaining harperella population near the historical site on the Deep River, using ex situ-propagated plants. Staff designed the reintroduction to test the efficacy of using streambed stabilization treatments (TerraCell® and coconut fabric) in comparison to planting in natural cobble. These treatments were chosen because it is particularly challenging to establish an emergent aquatic plant that occupies the uncertain habitat of riverine gravel bars. TerraCell® is a plastic-celled stabilization material within which harperella can be planted, and coconut fabric is a combination of coconut fibers and a fine plastic netting through which vegetation can be planted. The natural cobble represented a quasi-control treatment, where harperella was

(See Harperella, page 5)

Frequency of *Ptilimnium nodosum* per plot and treatment type.





# Harperella results still being studied for success rate

(Continued from page 4)

planted in an unprotected, but natural, substrate.

In June 2006, NCBG staff planted 70 individuals in each of nine experimental plots, representing three replicates of three treatments, for a total of 630 plants. The reintroduction site was approximately 100 meters downstream of the historical harperella station within the Triangle Land Conservancy's Second Island Preserve in a semi-permanent cobble bar.

Of the 630 original plants, 314 survived the first growing season: 139 in the coconut fabric, 106 in the TeraCell®, and 69 in the natural cobble. Note that two flood events occurred—one and two days after the reintroduction—both covering the plants with approximately one meter of water. Additional plants were undoubtedly lost to repeated floods over the first growing season and unexpected herbivory by deer, Canada geese, and muskrats. The results are clear, however, that the coconut fabric stabilization treatment was most effective over the establishment phase and afterward.

Within the first growing season, considerable flowering and vegetative reproduction occurred. Approximately 800 inflorescences were produced that contained an estimated 320,000 flowers. Although we did not collect seed production data, we estimate that over 600,000 seeds were produced over the growing season.

Because of harperella's vegetative reproduction habit, following individuals in subsequent years was not possible. Staff therefore established permanent plots of one square meter, subdivided into 100 cells, each being 10 square centimeters, in each treatment and replicate, and scored for harperella presence/absence. They noted flowering/fruiting, but did not make counts. Monitoring data from 2007 to 2010 show that there has been a general decline in the permanent plots except for one coconut fabric plot (plot 1), one TerraCell® plot (plot 2) and one control plot (plot 1), where there is a slight increase (Fig. 2). It is important to note that numerous individual plants were seen outside of the permanent plots and in adjacent permanent plots, which shows that recruitment is occurring and that the ap-

pearance of general decline within the reintroduction site may be in part an artifact of constraining our sampling within plots. Tracking population expansion will require modifying the spatial extent of our sampling to determine if the reintroduction established a self-sustaining Harperella population

The predicted medium- to long-term success of our reintroduction is based on several factors. Because our Harperella reintroduction occurs in a semi-stable cobble bar within the primary Deep River channel, flood scouring and debris deposition will present ongoing threats and opportunities for expansion. And because Harperella is an emergent plant, herbivory from waterfowl, mammals, fish, and turtles is possible. But because harperella is an herbaceous perennial with adventitious root growth, a profligate seed producer, and can reproduce vegetatively from fragmentation and plantlet formation, on-site survival and dispersal to other locations is likely.

Johnny Randall and Mike Kunz, NCBG

## •Sign up for swamp and prairie trips now

(Continued from page 2)

found. Long before the grasses have grown to their full height, the native wildflowers color the prairies. This tour is scheduled to take advantage of the wildflowers' peak season of bloom.

The tour will visit the Tallgrass Prairie National Preserve (which now has its own herd of bison), Konza Prairie Biological Station, Maxwell Wildlife Preserve, Kaw Heritage Trail and Kanopolis State Park, and others. The tour will also visit a working ranch and hear the owner's perspective on native plants. And plans are being made to meet with members of the Kansas Native Plant Society at one of the destinations. Optional activities

that you might enjoy are the Friday Kaw Intertribal Pow Wow and the Saturday morning parade in Council Grove, a part of Washunga Days.

A two-story ranch house located near the historic Santa Fe Trail has been reserved for the group. Rooms will be double or triple occupancy, depending on the number of participants. A full kitchen is available for use. The ranch also has trails that can be explored.

Cost for the tour is \$450 which includes all lodging, field trips, and fees, and lunches in the field. Participants are responsible for all other meals and transportation to Kansas. For this tour, registrations and a deposit of \$200 are needed by April 1, and full payment is due by May 1.

For those who will be flying to Kansas, reservations should be made for arrival at the Kansas City, [Mo.] Missouri International Airport [RCI] by early afternoon on June 11. For return flights, on June 18, a late morning or early afternoon departure would be preferable. Transportation while on tour will be by private car/carpool for those who plan to drive or rent a car. For those who fly, transportation will be arranged if the need arises and the costs will be shared by the riders. Please inform us if you are in need of this option so that plans can be made.

Questions for either trip can be directed to Linda Wilcox at 757-468-4346 or w8n2cwildflowers@cox.net or the VNPS office at 540-837-1600 or vnps@shentel.net.



# Hybridizing tendencies can be perplexing

(Continued from page 1)

their parent species. Typically, one finds mixed combinations of the parents' characteristics, or intermediate character states, or both; rarely, an extreme expression of one parental character can be observed. So, when identifying oaks, one needs to be prepared to encounter specimens that scramble the usually encountered character patterns. It could be worse, though. For one thing, oaks hybridize only within closely related groups of species. White oaks hybridize only with other species classified in the white oak group, i.e., trees with rounded leaf lobes and acorns that mature in a single year (several of which are listed in the previous paragraph). Similarly, various species from the red/black oak group, trees with bristle-tipped leaf lobes and acorns that mature over the course of two seasons, hybridize with each other. But hybrids between the white oak group and the red/black oak group simply do not occur. Further, many plant groups with rampant hybridization also exhibit additional complexity resulting from polyploidy, whole-genome multiplication in which complete sets of chromosomes become duplicated in hybrids and their offspring. Mercifully, polyploidy is virtually unknown in the oaks, even among the hybrids. In fact, chromosome numbers throughout the oak family (oak, beech, chestnut, etc.) are monotonously uniform: 12 chromosomes in each pollen and egg cell and, hence, 24 chromosomes in all other cells (half of which came from the pollen parent and half from the egg parent).

Clearly, at a practical level, the existence of oak hybrids can complicate species identification. Oak hybrids also present some theoretical issues. In theory, species maintain their genetic integrity by reproducing within closed gene pools. Said another way, breeding populations of a species remain isolated from the breeding populations of other species. The integration of ideas about gene flow within species and barriers to gene flow between different species are at the heart of what has become known as the biological species concept, developed largely by Ernst Mayr and colleagues in the 1930s and 1940s. In essence, the biological species concept posits that one or more

aspects of the biology of two different species should operate to prevent their interbreeding or, more subtly, to minimize gene flow between them even if occasional hybrids do form. These biological factors have come to be known as reproductive isolating mechanisms. These isolating mechanisms are credited with great theoretical significance because, in the absence of genetic isolation, species would lose their distinctiveness, hybridizing rampantly, and blending insensibly with others.

So-called external (or extrinsic) reproductive isolating mechanisms prevent interbreeding from occurring in the first place; several of these (or their breach) can be illustrated (or postulated) with white oak and its known hybrids. For example, in nature, the English (*Q. robur*) and North American (*Q. alba*) white oaks occupy different continents, a distance more than sufficient to isolate the wind-blown pollen of each from reaching the stigmas and ovules of the other. However, when English oaks are cultivated in the U.S. and our white oaks are cultivated in Europe, their natural geographic barrier is breached and hybrids, called *Q. x bimundorum* ("of two worlds"), form. In this case, under natural conditions, the geographic barrier is sufficient to provide genetic isolation between these two species, and hybrids form only as a consequence of human activity.

Within its native geographic range—which is most of eastern North America—the ecological range of *Q. alba* is also quite broad. But white oaks don't grow everywhere. Sites with nutrient-poor and droughty soils tend to support the growth of post oaks better than white oaks, and swamp white oaks are much better adapted to soggy wet bottomlands than ordinary white oaks. To some extent, then, despite broad overlap in their geographic ranges, ecological factors tend to segregate the parent trees by their preferred habitat, and that may help to limit whole-sale cross-pollination between these species—limit it, but not totally prevent it, because we do have hybrid trees as testimony to the occasional failure of these ecological barriers. It is not difficult, for example, to imagine white oak pollen blowing to droughty ridgetops or swampy bottomlands. Of course, the further a given pollen grain travels from its source tree, the greater its probability of dropping out of the air, so ecological separation may offer

some partial measure of genetic isolation, even among wind-pollinated oaks.

The timing of pollen release and stigma receptivity may well be another external mechanism that imperfectly separates the breeding pools of species within the white oak group. Sometimes called seasonal isolation, this factor for oaks might be better described as temporal isolation because most oaks shed pollen more or less coincident with spring bud break, and the timing differences between different oaks are likely to be on the order of just a few days or weeks. I know of no detailed comparative phenological data for the hybridizing white oak group species discussed above. By analogy, however, there is some evidence that live oak (*Q. virginiana*) and sand live oak (*Q. geminata*) from the same general region shed their pollen a few weeks apart from each other, so it is conceivable that timing differences could serve to separate white oak from its nearest relatives at least some—maybe most—of the time.

Geography, ecology, and timing of pollen release may provide some genetic isolation between the various species of the white oak group, but the well-documented existence of hybrids indicates that these potential barriers are, at the very least, somewhat porous for oaks.

In addition to external isolating mechanisms, the biological species concept also incorporates so-called internal (or intrinsic) isolating mechanisms that operate as barriers to gene flow between species in spite of the occasional formation of hybrids. In essence, internal isolating mechanisms posit the existence of genetic incompatibilities between the two genomes combined via hybridization. For example, a hybrid embryo may form, but not survive to the point of birth (animals) or seed germination (plants); alternatively, hybrids may survive, but fail to form gametes, as in sterile mules and various sterile hybrid plants. In both cases, the opposing sets of genes from the two parent species fail to work together in a coordinated way and the hybrid is impaired in one way or another. In theory, then, such hybrids represent dead ends in terms of potential gene flow between their parent species. Clearly, in the case of oaks, hybrids do

(See Oaks, page 7)



# •Oaks

(Continued from page 6)

form and they can grow to become mature trees that shed pollen and bear acorns. So, it seems that the internal isolating mechanisms of hybrid inviability or hybrid sterility don't apply.

There is one last internal isolating mechanism that might apply to white oak species: hybrid breakdown. The core concept behind hybrid breakdown is the idea that while hybrids may form, grow, and reproduce, the hybrids themselves and their offspring simply may not be as well adapted to their environment as either of their parents and so the hybrids—and their offspring—simply fail to thrive and suffer higher mortality than either of their parent species, thus limiting the degree of genetic mixing that occurs between the parental species. Does hybrid breakdown serve to isolate species of oak known to form occasional hybrids? That's hard to say. Documenting hybrid breakdown requires detailed study of every pertinent individual of the two parental species and all their hybrid offspring within breeding (or crossbreeding) populations over multiple generations. That's a lot of work for annual plants which complete a generation every year; but nearly impossible when individual oak trees may take a few decades to reach reproductive maturity, and then continue to shed pollen and disperse acorns for a few hundred years.

It would be interesting to know, for example, if hybrids of white oaks ever attain great age similar to that commonly observed in "pure" white oaks.

So what does this all mean? For one thing, because of the multiple hybrid combinations known to occur among white oak group species in nature, application of the biological species concept might lead one to consider all members of the white oak group as a single interbreeding gene pool and thus one big, morphologically diverse species! And ditto for the red/black oaks prone to hybridization. This possibility was discussed formally by Burger (1975) but he and subsequent botanists have rejected such an extreme, although fully logical, deviation from traditional species concepts among the oaks. The key seems to lie in the numbers. Yes, white oaks do form hybrids with at least eight other species in eastern North America, but the vast majority of white oak trees encountered in any forest or woodlot fall easily within the traditional morphological concept of *Quercus alba*. Hybrid individuals, though certainly present here and there, are relatively rare, and oaks assignable to traditionally recognized species are extremely numerous. Even rarer are instances of hybrid swarms, populations composed of hybrids and all manner of intermediates between their parent species. Without a doubt

some mixing of genes between different oaks does occur, but not at a rate sufficient to threaten the genetic integrity of each species as a whole.

This essay opened by framing the existence of oak hybrids as a vexing roadblock to specimen identification; one often hears reference to hybrid oaks cast as an annoyance to straightforward identification and classification, and I'll admit that I have adopted that tone on occasion, myself. But maybe there is value in thinking about hybrid oaks from a different perspective. The white oak group species of the forests of eastern North America are sympatric over tremendously large areas, they all flower roughly at spring bud-break, they are passively pollinated by wind, and they are certainly capable of forming hybrids . . . so how is it that hybrids are relatively rare? How do the species involved remain reasonably distinct from each other? Rather than vexation, maybe we should adopt an attitude of awe and respect for the complexity of biological processes that, playing out on continental scales, involving untold millions of individual trees, and millennial time frames, challenge our best efforts at comprehension. White oaks are such common trees, who could imagine that their coherence as a species could be so wonderfully complex to contemplate?

W. John Hayden, Botany Chair

See the address label for your membership expiration date

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\_\_\_Individual \$30

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\_\_\_Associate (groups) \$40\*

\_\_\_Patron \$50

\_\_\_Sustaining \$100

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\*Please designate one person as delegate for Associate membership

To give a gift membership or join additional chapters: Enclose dues, name, address, and chapter (non-voting memberships in any other than your primary chapter are \$5)

I wish to make an additional contribution to \_\_\_VNPS or\_\_\_\_\_Chapter in the amount of \_\_\_\$10\_\_\_\$25\_\_\_\$50\_\_\_\$100\_\_\_\$(Other)\_\_\_\_\_

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\_\_\_Check if you do not wish your name to be listed in a chapter directory

Which chapter do you wish to join? (See [www.vnps.org](http://www.vnps.org))\_\_\_\_\_

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Make check payable to VNPS and mail to:

VNPS Membership Chair, Blandy Experimental Farm, 400 Blandy Farm Lane, Unit 2, Boyce, VA 22620

Membership dues are tax deductible in the amount they exceed \$5. Contributions are tax deductible in accordance with IRS regulations.

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## •Events

(Continued from page 3)

ticipants will be carpooling. Meet at 9 a.m. at the Bloom grocery store in Marshall. Contact Carrie at 540-364-1232.

**Saturday, April 16, Earth Day in Staunton, 9 a.m.-noon, & Shenandoah Chapter plant sale** behind the farmers market. Barbara McSweeney at 540-363-1116 or barbmcs@newhopetel.net. Proceeds benefit Flora of Virginia Project.

**Saturday, April 16, 10 a.m.-noon, Annual Calmes Neck Bluffs Wildflower Walk** (Piedmont Chapter). A VNPS registry site,

## Ash borer class offered

The emerald ash borer beetle is an active threat to our ash tree species in the Fraxinus family. Now there is a free online course developed by Eric Wiseman, Virginia Tech professor of urban forestry, that will help identify and control this destructive insect. The course targets green space enthusiasts and green industry professionals with the intention of increasing our collective capacity to detect and manage emerald ash borer in Virginia. The course is eligible for CEUs from an assortment of professional organizations. For more information, visit <http://www.hort.vt.edu/eab>.

Calmes Neck Bluffs offers a rich mesic forest and ravines with spectacular masses of bluebells and other spring wildflowers along the Shenandoah River. Gary Fleming, vegetation ecologist with the Natural Heritage Program, will lead the moderate walk (expect to climb over downed trees). Bring lunch and chair and gather at river afterward. Contact Blanca Vandervoort at 540-837-1637 or cvanderv@nelsoncable.com.

**Saturday, April 16, 9 a.m.-1 p.m., Buffalo Creek Field Trip** (Blue Ridge Wildflower Society). Visit this VNPS Registry site with Rich Crites. Plants to see include bluebells, dwarf ginseng, walking ferns, and dwarf iris. Contact Rich Crites 540-774-4518.

**Saturday, April 23, 10 a.m.-12:30 p.m. Booker T. Washington Monument Field Trip** (Blue Ridge Wildflower Society). Marshall Daniels and Rich Crites will lead the group along the Jack-O-Lantern Trail in search of spring beauty, foamflower, Mayapples, bluebells, and pink lady-slippers. Moderate walking. Bring a lunch. Contact Marshall Daniels 540-721-8304.

**Saturday April 30, Riverfest in Waynesboro includes Shenandoah Chapter plant sale** at Farmer's Market as part of Riverfest. Barbara McSweeney at 540-363-1116 or barbmcs@newhopetel.net. Proceeds benefit Flora of Virginia Project.

**Friday, Saturday, Sunday, May 6, 7 and 8, Garden Fair at the State Arboretum of Virginia** in Boyce, Clarke County. Direc-

tions and information online, [www.virginia.edu/Blandy](http://www.virginia.edu/Blandy).

**Saturday, May 7, Roaring Run Furnace Field Trip, 9 a.m.-1 p.m.** (Blue Ridge Wildflower Society) Join Butch Kelly and Rich Crites for a field trip to Roaring Run Furnace in the George Washington-Jefferson National Forest to see shale barren species and picturesque waterfalls. Trail is rolling, but not steep. Bring a lunch, sun screen, sturdy shoes and rain gear. Contact Butch Kelly at 540-384-7429.

**Saturday, May 14, 9 a.m.-noon, Blue Ridge Wildflower Society Spring Wildflower Plant Sale**, Virginia Western Community College behind the arboretum and greenhouse. Contact Rich Crites 540-774-4518.

**Saturday, May 28, 10 a.m.-1 p.m., Rhododendron Day on the Blue Ridge Parkway.** Meet leader Rudy Albert at the Peaks of Otter Visitor Center. We hope to catch catawba rhododendron at peak bloom on this overlook hopping expedition. Very little walking. Contact Rudy Albert at 540-774-2279.

**Wednesday-Saturday, June 1-4, Native Plants in the Landscape conference**, Millersville University, Lancaster, PA. For info, see [www.millersvillenativeplants.org/](http://www.millersvillenativeplants.org/)

**Wednesday-Saturday, July 27-30, The Cullowhee Native Plant Conference**, Western Carolina University, Cullowhee, NC. For more information go to [www.wcu.edu/5033.aspd](http://www.wcu.edu/5033.aspd).

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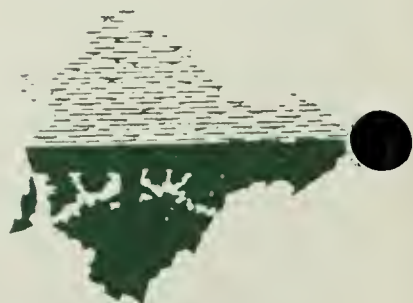


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# Bulletin

A publication of the VIRGINIA NATIVE PLANT SOCIETY

<http://www.vnps.org>

Conserving wild flowers and wild places

## 2011 Annual Meeting offers exploration of diverse habitats

The Prince William Wildflower Society invites you to the Virginia Native Plant Society Annual Meeting September 16-18. We will explore the diversity of flora and fauna in Virginia's only county that spans three geologic provinces, from Bull Run Mountain to the coastal plain on the Potomac River. The Prince William area is historically rich and provides an exciting backdrop for hiking, canoeing, exploring both urban and rural wilds, learning from eminent naturalists and presenters, and visiting with old and new friends.

Field trips will allow us to explore by foot our diverse ecosystems including the Bull Run Mountain Natural Area Preserve, Manassas National Battlefield Park, Prince William Forest Park, and Featherstone National Wildlife Refuge (FNWR), a place that is not open to the general public, and experience the Occoquan River by canoe and kayak. Participants can choose from trips that will allow them to reminisce on

**VNPS  
Annual  
Meeting  
Sept. 16-18**

last year's mountainous venue by hiking in the Bull Run Mountain Natural Area Preserve; go back in time 150 years after the First Battle of Manassas while exploring the natural and cultural history of Manassas National Battlefield Park; or visit the state's newest and northernmost wildlife management area, Merrimac Farm in Nokesville.

The Town of Occoquan's website includes the following information: "Occoquan is derived from a Dogue Indian word meaning 'at the end of the water.' It is believed that the Dogues stayed close to the Occoquan River because of the abundance of fish and

ease of traveling by canoe." Participants in the Occoquan River field trip will follow the path of Native Americans and others by canoe and kayak while observing the diverse flora found along this unique riparian corridor.

The trip to FNWR will allow participants a unique opportunity to explore a Potomac River refuge that has been closed to the public for 40 years. Featherstone contains a diverse complex of tidal and non-tidal freshwater wetlands and associated uplands that is currently being inventoried by members of VNPS and other groups in partnership with refuge staff.

Please join us for these and other exciting field trips, speakers, and a meal and social events with fellow society members. A complete listing of events for the annual meeting as well as registration information will appear in the next issue of the *Bulletin*.

Charles Smith, PWWS



***Invasive insects threaten Virginia trees***  
**Pages 4 & 5**





## From the president . . . . .

### *Let the earth's plants empower you*

On September 22, 2010, Col. Douglas H. Wheelock assumed command of the International Space Station and the Expedition 25 crew. His photos were sent to me in a PowerPoint presentation by my brother who works at NASA. Here is his text that accompanied a photo of the earth's atmosphere illuminated from behind by the sun:

**Another breathtaking sunset . . . we get 16 of these each day in Earth orbit, each one a treasured moment. That beautiful thin blue line is what makes our home so special in the cosmos. Space is cool . . . but, the Earth is a raging explosion of life in a vast sea of darkness."**

*Now that is perspective! From our earthly perspective, it's spring and a great time to share the importance of that thin blue line and the plant life that helped create it and that sustains it. A wealth*

*of opportunities exist to hike, learn, help, and teach. For those of you who have been coming along on visits to natural places for years, maybe now is the time to step up and help your chapter with events, walks, presentations, newsletter articles and plant sales, or consider volunteering for a board position. It seems to me everyone has something to offer, including you!*

*In the past year, VNPS formalized a partnership agreement with the Flora of Virginia Project. I feel so proud of our organization and our accomplishment of meeting last year's fundraising goal for the Flora. I rather arbitrarily set \$20,000 as a goal, and it was more than met. I'd like you to know that you received a very nice letter of appreciation from Chris Ludwig, President of the Flora of Virginia Project, which characterized your gift as "...more than significant, it is empowering!"*

*Thanks so much to all of you for your generosity and support for our fundraising and our other programs.*

*See you soon on the trail I hope!*

**Your VNPS President, Sally Anderson**

## Apps and exhibits in the *Flora's* future

In April, Chris Ludwig, Alan Weakley, and Johnny Townsend, co-authors of the *Flora of Virginia*, held their final summit to iron out details of the book, scheduled for publication in fall 2012. As production enters its last stages, the Flora of Virginia Project is looking at its next steps. Two exciting new efforts are sure to put Virginia's plants and the Flora Project even further in the public eye.

### **Going digital**

The Virginia Environmental Endowment (VEE) in April awarded the Flora Project \$32,500 for an 18-month plan of work titled "The Digital Flora of Virginia: Data Based." The grant funds the first step of creating from the *Flora* a digital version, or app, that will operate on handheld devices, such as smartphones and tablet computers. It will also be available on PCs.

Under the VEE grant, the content

of the *Flora* will be turned into a database, which is necessary for a flexible and powerful digital format. In addition, the *Flora* data will be linked, by plant species, to other groups' databases. The app itself will be created in a second phase once the database work is complete.

Searches will be easy and customizable. In addition to plant descriptions and interactive keys for identification, users will be able to retrieve detailed habitat and range information, as well as photographs and illustrations. The Digital Flora will also allow updates, including additions and corrections, changes in taxonomy, and new plant discoveries. And online forums are planned so that *Flora* users may communicate with one another and with the Flora Project about the *Flora* and educational activities based on it.

### **Flora at center stage**

The spotlight will shine on our plants in 2014 as the Library of Virginia, in Richmond, will host an exhibit titled "The Flora of Virginia" from March to September. A committee has been formed that comprises the library's exhibition team, led by Barbara Batson, and representatives of the Flora Project. Bland Crowder will be curator of the exhibit; Johnny Townsend, botanist with the Virginia Natural Heritage Program and *Flora* co-author, and Randee Humphrey, of the Flora Project's board of directors and director of education at the Lewis Ginter Botanical Garden in Richmond, are also on the committee.

The exhibit will be housed in both the lobby and the gallery on the first floor of the library. Content has barely been considered so far, but expect to

*(See Flora, page 8)*



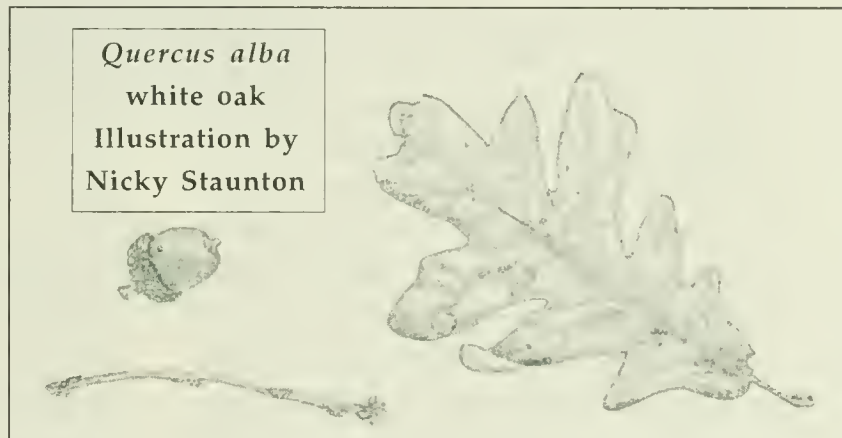
# White oak part of global oak presence

As we act locally celebrating white oak, *Quercus alba*, as the 2011 VNPS Wildflower of the Year, it is perhaps appropriate to think globally for a few moments and consider the breadth of diversity encompassed by the oaks. *Quercus* is a big genus, easily the largest in its family, the Fagaceae. Approximately 400 species of oak are known, and they are widely distributed in the northern hemisphere. We tend to think of oaks as temperate zone trees, but in the New World, their range extends south through the mountains of Central America to Colombia and in the Old World, into the tropics of southeast Asia.

As might be expected of such a large and widespread genus, several subgroups of oaks can be recognized. Oak subgroups were first distinguished on the basis of morphological features; in recent years molecular (DNA) characters and the details of pollen structure have reinforced the definition of these groups. Specialists do quibble about the details, but recognition of six prominent subgroups seems well established in recent literature. Yes, six! Only two of these subgroups are found in eastern North America. It is remarkable how many of the references for oaks in our region refer to our two local subgroups as if they were the only subgroups of oak. In truth, the many oaks that grace our woods represent just a fraction of oak diversity on a global scale—hence the motivation for outlining this broader perspective of the genus. Two of the six major groups of oaks occur only in the New World, three are restricted to the Old World, and one, the white-oak group, is found in both.

While the composition of oak subgroups seems to be nearing consensus among botanists, the subgroups' nomenclature remains chaotic. Suffice it to say that application of for-

mal names depends on numerous details: the degree of lumping or splitting among subgroups, for one thing, and the rank in the taxonomic hierarchy—subgenus, section, or subsection—to which any subgroup is assigned, for another. Different botanists see these things differently and, accordingly, they wedge oak natural



diversity into the categories of classification to fit their particular interpretation. Consequently, we still see some proliferation of oak subgroup names. For the discussion that follows, names will be used in a strictly informal fashion independent of taxonomic rank, with an attempt to include frequently used synonymous (or nearly synonymous) alternative group names.

**Intermediate or golden-cup oaks (*Protobalanus*):** *Protobalanus* constitutes the smallest subgeneric group of oaks, consisting of just five species that range from southern Oregon to northern Mexico. Leaves are entire or toothed and evergreen, acorns take two seasons to reach maturity, and acorn caps are densely glandular hairy, so much so that the individual bracts are indistinct except for their tips. *Quercus chrysolepis* (canyon live oak, maul oak), a highly variable species, is the most widespread member of the group.

**Red/black oaks (*Lobatae*, *Erythrobalanus*):** The red/black oak group is also restricted to the New World, with some 195 species, only 35 of which occur north of Mexico—which means that the true center of diversity of “our” red/

black oaks is well to our south! Leaves may be deciduous or evergreen, lobed, toothed, or entire; toothed leaves have prominent bristletips; acorns take two years to reach maturity for most species. Included here are familiar trees like the red, scarlet, pin, black, blackjack, willow, water, turkey oaks, and a plethora of trees from high-altitude regions of Mexico and Central America.

**White oaks (*Quercus*, *Lepidobalanus*, *Leucobalanus*, *Mesobalanus*):** Species belonging to the white oak group occur both in the New and Old Worlds; it is thus geographically the most widespread subgroup of oaks. Some 200 species have been recognized, with 51 found across the breadth of

North America north of Mexico. Leaves may be deciduous or evergreen, lobed, toothed, or entire; when present, leaf teeth are never bristle-tipped; acorns mature within a single season. The white oak group includes many familiar local species including white, burr, post, chestnut, and swamp chestnut oaks. The evergreen live oaks (*Quercus virginiana* and close relatives) of the southeast and Gulf coast also belong here, as do many more species from Mexico, Central America, Europe, and Asia. *Quercus robur*, the English white oak, is perhaps the best-known exotic species of this group; it and some of its hybrids are sometimes cultivated as specimen trees in the U.S. Also notable is the gall or dyer's oak, *Quercus lusitanica*, from the Iberian Peninsula and nearby northwest Africa; insect-induced galls that form on this (and some related species) yield tannins used as a dark-colored dyestuff.

**Cycle-cup oaks (*Cyclobalanopsis*):** Cycle-cup oaks encompass about 150 species found in tropical and subtropical regions of southeast Asia. These evergreen oaks have remarkably distinctive acorn caps that consist

(See *Oak diversity*, page 8)



Hemlock woolly adelgid*Biological controls look promising**Hemlock woolly adelgid*

The hemlock woolly adelgid (HWA), *Adelges tsugae*, is an invasive insect pest native to Asia, and was accidentally introduced into the eastern United States sometime in the mid-20<sup>th</sup> century from Japan. Since its initial discovery in Richmond in the 1950s, HWA has infested eastern hemlock, *Tsuga canadensis*, and Carolina hemlock, *T. caroliniana*, forests over much of their geographic ranges, often causing extensive tree mortality, especially in old-growth eastern hemlock stands.

Because hemlock-dominated forests cover approximately 2.5 million acres in the eastern United States, control of HWA is of crucial importance both environmentally and economically. A neonicotinoid insecticide called Imidacloprid is most commonly used to chemically control HWA in forest and urban environments by way of soil and trunk injections. However, classical biological control of HWA (the introduction of its natural enemies from its country of origin) began in the mid-1990s, and is now the largest biological control program for any forest pest in North America.

Biological control is the preferred method of suppressing HWA in natural forest ecosystems. Although no effective natural enemies of this adelgid species are known to occur in the eastern United States, *Laricobius rubidus*, a native beetle predator of the pine bark adelgid, *Pineus strobi*, has been

**Scientific name:** *Adelges tsugae* (Annand)

**Common name:** Hemlock Woolly Adelgid

**Native to:** Asia

**U.S. Introduction:** 1920s (West Coast); 1951 (East Coast)

observed feeding and reproducing on it. Starting in 1992, entomologists began surveying for predator insects in China, Japan, and northwestern North America that could be used as biological control agents of HWA. By 1996, several small beetles, each no longer than 3 mm, had been identified as possible controls. These included *Sasajiscymnus tsugae*, a lady beetle from Japan, several species of *Scymnus*, lady beetles from China, and a derodontid beetle, *Laricobius nigrinus*, from British Columbia, Washington, Oregon, and Idaho. Since then, more than 2 million *Sasajiscymnus tsugae* have been released in 16 states including the stretch from Maine to Georgia. Since 2004, more than 25,000 *Scymnus sinuanodulus*, the most promising of the *Scymnus* lady beetles, have been released in 11 eastern states. Of these two lady beetle species, *Sasajiscymnus tsugae* (a Web search will lead to more interesting information about this friendly insect) appears to have the most potential as a biological control agent, in part due to its being more successfully mass-reared in the laboratory. However, individuals of both species have been recovered near release sites since their release, confirming their establishment and reproduction, though in fairly low numbers.

The beetle *Laricobius nigrinus*, native to the Pacific Northwest, feeds primarily on HWA infesting western hemlocks, *Tsuga heterophylla*. As with all the HWA biological control agents, *L. nigrinus* was held in quarantine for a period of time before being released. Quarantine studies were conducted on this species at Virginia Tech in Blacksburg. While in quaran-

tine, it was determined to be host-specific (feeding only on HWA), and, after federal and state approval in 2003, it was first released into Virginia hemlock forests. Laboratory mass-rearing techniques had been developed for this predator at Virginia Tech by 2005, and the species is now being mass-reared there and at additional labs in the eastern U.S., including facilities at the University of Tennessee, Clemson University, and the University of Georgia. Since 2003, around 100,000 *L. nigrinus* have been released at more than 80 locations from Massachusetts to Georgia, and the beetles have established small populations at nearly 60 percent of the monitored release sites. Support and funding for the mass-rearing of this and other agents has been provided primarily by the USDA Forest Service.

In addition to the agents described above, three new predator species show promise. *Leucopis argenticollis*, a small fly native to western North America, has been observed feeding on HWA. *Laricobius osakensis*, a derodontid beetle from Japan, was recently approved for release after being studied in quarantine at Virginia Tech. And *Scymnus ningshanensis*, another small lady beetle from China, may also be effective if released in large numbers. Long-term monitoring and assessment of predator impacts on HWA populations in the eastern U.S. is ongoing, yet it is hoped that eventually HWA densities can be suppressed to levels that have fewer detrimental impacts on our beautiful hemlock forests.

Ryan Mays, Research Specialist,  
Virginia Tech



# Another invasive insect destroying native trees



*Emerald green ash borer*

Depending on where you are in Virginia, you might have seen the mysterious purple triangular contraptions, 14 in. by 24 in., hanging from trees. The objects are not part of some secret government experiment. They are emerald green ash borer traps placed in trees by the Virginia Department of Agriculture and Consumer Services (VDACS) to catch the invasive beetles so that the extent of ash borer infestation across the commonwealth can be determined.

The traps are baited with a natural plant oil attractant and covered with a nontoxic glue to catch the insects. VDACS officials said the traps have been especially useful for detecting new infestations.

Over the course of several years the traps have been placed around the state. This year's survey will focus on central, southern and western Virginia. About 5,500 traps will be set for the beetles, which have killed tens of millions of trees in the eastern U.S. and Canada.

The borers feed on a tree's inner bark and disrupt its ability to trans-

port water and nutrients. The damage becomes apparent when the top third of the tree weakens and produces little growth. Eventually the tree dies. Apparently it's not the adult insect that does the damage but, rather, the larvae that eats their way through the interior of the trees. Woodpeckers seem to enjoy ash borer dinners, so that's somewhat of a help.

The borers were introduced accidentally into the U.S., most likely in wood-packing materials, such as shipping crates, coming from Asia, and were first detected in Michigan in 2002. They were first found in Virginia later that same year, at a Fairfax County elementary school, where infected ash trees originating from a nursery in Michigan had been planted. To prevent the spread of the beetles, all ash trees within half mile of the school were cut and chipped.

But the beetles were detected again in Fairfax in 2008. Agriculture officials established a quarantine for 10 Northern Virginia counties and cities, expanding it in 2010 to include the northern Shenandoah Valley counties of Frederick and Clarke and the city of Winchester.

The quarantine restricts shipments of ash trees, green lumber from ash trees, and hardwood firewood.

"The damage caused by this invasive insect can mean the loss of millions of dollars for homeowners, landowners, and the nursery and forest products industries," said Virginia Agriculture Commissioner Matthew J. Lohr.



*An ash borer trap hangs from a tree in the Shenandoah Valley. Most of those tiny dots on the sides of the trap are ash borers. (Photo by Nancy Sorrells)*

## Bulletin takes first place

The VNPS *Bulletin* garnered a first place award in the newsletter category of the Virginia Outdoor Writers' Excellence in Craft Contest. Winners were announced in April at the Virginia Outdoor Writers Association (VOWA) annual meeting held at Bear Creek State Park.

The contest specified that each entrant choose one representative issue from those newsletters produced in 2010. The first place *Bulletin* entry was the Summer 2010 issue. That issue contained articles on lost native ladybugs with extensive illustrations by Nicky Staunton. Another featured topic in the issue focused on quails and their need for native grasses. That article was illustrated with drawings by Spike Knuth.

VOWA is a coalition of writers, photographers, and video/film producers who inform various media on the outdoors and its enjoyment. Through the association members strive to improve their craft and increase their knowledge and understanding of the outdoors. VOWA members pledge to support the conservation of Virginia's natural resources and to the best precepts governing their consumption and recreational use. For more information about VOWA, visit [www.vowa.org](http://www.vowa.org).

## Virginia dam removals help restore wetlands

Three state dams were recently breached on purpose in order to enhance the quality of waters flowing into the Chesapeake Bay and help restore the wetlands and marsh habitat around the waterways. The work was funded by the Virginia Aquatic Resources Trust Fund.

In Charles City County an earthen dam on Kimages Creek was breached, returning 50 acres of wetlands that will sustain wintering birds and allow migratory fish to return to freshwater marshes to spawn.

At Cumberland Marsh Preserve in New Kent County, the removal of two dams opens the way for the restoration of marsh and swamp habitats, the re-establishment of 1,500 ft. of meandering stream, and the return of tidal flows.



## Shale barren rock cress

# Mustard family member among world's rarest plants

Shale barren rock cress (*Arabis serotina*) is an erect flowering biennial in the mustard family (Brassicaceae) characterized by an inconspicuous basal rosette of lobed leaves. In its reproductive stage, the basal leaves shrivel as the slender stem grows, or bolts, and the inflorescence develops. Whitish flowers may be produced from June to September.

VNPS sponsorship of this plant through Center for Plant Conservation (CPC) will contribute funds for research related to conserving the plant. The CPC is a network of 36 leading botanic institutions. One of these institutions is designated as the custodian for each rare plant. For *Arabis serotina*, the North Carolina Botanical Garden is custodian.

The plant is endemic to the mid-Appalachian shale barrens of Virginia and West Virginia. These barrens occur on eroding shale formations with a steep slope and southern aspect. The harsh surface conditions of the area are probably an important factor in germination and seedling establishment. The shale-covered slopes may also host sparse, scrubby growth of oaks, pines, and junipers. One of the most restricted shale barren endemics, rock cress is known from at most 60 populations. Plant populations are generally fewer than 20 individuals and fluctuates considerably in numbers. Pollinators include bees of the genera *Apis*, *Halictus* and *Adrena* and syrphid flies.

Shale barren rock cress was listed as a federally endangered species in 1989. Its rank as of 2009 was G2, or imperiled, defined as at high risk of extinction due to very restricted range, very few populations, steep declines or other factors. In Virginia, the Department of Agriculture and Consumer Services (VDACS) is responsible for listing threatened and endangered plant species. Shale barren rock cress was given an S1

ranking in 1991. S1 species are Critically Imperiled—at very high risk of extirpation due to extreme rarity, very steep declines, or other factors. The Nature Serve website states that the recovery potential of shale barren rock cress is largely unknown and that it is the "most threatened of all the shale barren endemics and the reason for this is not entirely clear." Research on populations of this plant is under way in both Virginia and West Virginia.

There are several documented threats to the survival of this species. Gypsy moth control with Dimlin has a possible devastating effect on the pollinators of shale barren rock cress. Habitat loss has occurred as a result of construction. Invasive exotic plants, especially spotted knapweed (*Centaurea maculata*) and several grass species may out compete this species. Browsing by deer, drought, and naturally low populations are also potential threats.

The mission of the (CPC) is to conserve and restore the imperiled native plants of the U.S. in order to secure them from extinction. Live plant material is collected from nature under controlled conditions and then carefully maintained as seed, rooted cuttings, or mature plants. Network institutions conduct horticultural research and carefully monitor these materials so that imperiled plants can be grown and returned to natural habitats. These conservation efforts are undertaken to complement other preservation efforts such as habitat protection and management.

VNPS is excited to be able to aid in the study of shale barren rock cress



*Arabis serotina*  
shale barren  
rock cress  
Illustration by  
Nicky Staunton

and the protection of one of our most threatened plants.

(Information for this article was largely taken from the CPC website. Additional information, photos, and references are available from [www.centerforplantconservation.org](http://www.centerforplantconservation.org). Additional information is available at NatureServe's Explorer website [natureserve.org/explorer/](http://natureserve.org/explorer/).)



# Discovery of botanical wall charts leads to exhibit

Last year when Lydia Kirchner was taking courses in botany and museum studies, members of the biology department at Randolph College in Lynchburg, discovered botanical a set of wall charts in the attic of the life science building. The wall charts were in very good condition, so the department contacted Randolph's Maier Museum of Art to inform them of their discovery. One thing led to another and Kirchner was chosen to research the history of the wall charts and to curate an exhibition about the charts at the Maier museum.

The exhibition, "Nature Perfected: The Art of Botanical Illustration," opened Jan. 23 and be open until July 31. Twelve wall charts are on view, along with pressed plant specimens, a 1920s microscope, and microscope slides from the late 1800s enhancing the significance of the wall charts and how they improve our understanding of plants at the microscopic level.

Many of the charts discovered in the attic were created by Jung-Koch-Quentell in the 1950s. Their trademark black background and colorful illustrations are still vibrant in spite of having lain in an attic for many years. Botanical wall charts have a history dating to the 1800s. They were first created in

Germany during a time of educational reform. The first wall charts originated in the 1820s, mostly for use in primary schools. In the 1840s, the student population increased 108 percent while the number of teachers increased only 40 percent. Wall charts allowed teachers to show supporting visuals in large classrooms filled with students.

From 1850 to 1890, botanical wall charts became very popular with the advent of color lithography. Contributing to the popularity of wall charts by Jung-Koch-Quentell specifically, is their absence of text. Because they lack text, the charts do

not have to be translated, making them very versatile.

Included in the exhibition are an original print by John James Audubon from the Maier museum's permanent collection, a 14th-century illuminated manuscript, and four books from the college's Lipscomb Library rare books collection. The books on display include: *Beautiful Ferns* by Daniel Cady Eaton, Charles Edward Faxon, and J. H. Emerton, published in 1882. This book features watercolors drawn from nature and accompanied with descriptive text.

*Information from Art Plantae website*

## Rare butterfly rediscovered

There's good news on the conservation front in Virginia. The frosted elfin butterfly, last seen in 1994, has been rediscovered. Zoologists with the Virginia Department of Conservation and Recreation's Division of Natural Heritage located populations of the frosted elfin butterfly (*Callophrys irus*) in the city of Suffolk, and a Natural Heritage volunteer at Antioch Pines Natural Area Preserve also found a population. This small butterfly is associated with habitats that are either fire-dependent or undergo other frequent disturbances. Antioch Pines is one of the preserves where prescribed fire management activities have been focused; as a result, multiple fire dependent species not seen in a long time have returned. These disturbances encourage the growth of the caterpillars' food plants, lupine and wild indigo. The Natural Heritage staff is currently involved in a two-year project to develop an atlas of rare butterflies, moths, dragonflies, and damselflies in Virginia.

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Nancy Sorrells, Editor

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# •Oak diversity

(Continued from page 3)

of a series of ringlike ridges. Whereas our familiar acorn caps look scaly, cycle-cup acorn caps look as if they have been turned on a lathe. In some species the acorns are borne in remarkably dense clusters. *Quercus myrsinifolia*, the Chinese evergreen oak, is rarely cultivated in our region, but several specimens are visible from my office window on the University of Richmond campus. Sometimes the cycle-cup oaks are split out as a separate genus.

**Cerris oaks (*Cerris*):** As a group, cerris oaks are strictly Eurasian. The leaves are evergreen or deciduous, bear bristle-tipped lobes, and the acorns mature in two seasons. A few species from this group are sparingly cultivated in the U.S., most prominently, *Quercus acutissima*, the sawtooth oak, and less frequently, *Q. cerris*, the European Turkey (or Turkish) oak. *Quercus suber*, from which cork is harvested commercially in southwestern Europe and northwestern Africa, also belongs here.

Cork oaks, incidentally, make prodigious quantities of outer bark, i.e., cork, an adaptation by which the trees are insulated from sporadic fires that sweep through this species' natural habitat.

**Holm or holly oak & relatives (*Ilex*):** The holly oaks are also strictly Eurasian, sometimes included within the cerris oak group, but distinguishable by details of pollen structure. Holly oak, *Quercus ilex*, is so named because its spiny leaves resemble those of holly; in fact, some sources indicate that *ilex* is the classical Latin name for this oak, which only later came to be applied as the genus name for hollies. *Quercus ilex* is also notable as one of several oaks that supports the growth of truffles. Another interesting species from this group is *Q. coccifera*, the kermes oak; this tree is host to the kermes scale insect, which can be harvested and processed to yield the natural red dye called crimson.

That's just a brief overview of oak diversity. When you think about it, it

is a remarkable genus indeed that stoppers the bottle of wine that we sip while dining on truffles that grow upon its roots and also furnishes the table and chair from which we enjoy these sublime refreshments.

W. John Hayden, VNPS Botany Chair

## •Flora

(Continued from page 2)

see antique books and prints on Virginia plants and the botanic exploration of Virginia, herbarium specimens, botanical art, as well as an interactive computer station and a video program. The path to publication of the *Flora of Virginia*, of course, will be featured. Educational activities and regional panel exhibits are also planned. Stay tuned!

Bland Crowder, Associate Director, Flora of Virginia Project

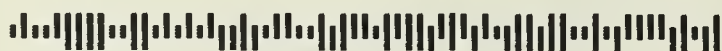
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# Bulletin

A publication of the VIRGINIA NATIVE PLANT SOCIETY

*Conserving wild flowers and wild places*

<http://www.vnps.org>

## Wild Places in Urban Spaces

# PWWS to host VNPS Annual Meeting

The Prince William Wildflower Society invites you to the Virginia Native Plant Society Annual Meeting September 16-18. This year's theme is Wild Places in Urban Spaces, emphasizing unique natural areas that are surviving in an increasingly urban landscape. To explore this theme we will hear Jim McGlone, Urban Forest Conservationist with the Virginia Department of Forestry, talk on Friday evening about "Managing Our Forest Lands for Ecological Health."

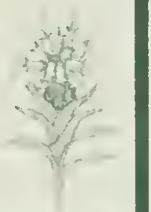
On Saturday evening our keynote speaker will be Karen Firehock, Director of the Green Infrastructure Center (GIC) and adjunct faculty member at the University of Virginia. Karen will address "Using Green Infrastructure Planning to Conserve Native Plant Communities."

Firehock co-founded the GIC and she brings 25 years of experience in environmental planning and natural resources management to her work. She oversees planning and research

projects at the regional, county, city and watershed scale. She has directed 10 green infrastructure planning field tests at the town, city, county and multi-county scale and is currently working on a green infrastructure plan for Northern Virginia and a Green Revitalization Plan for Richmond Virginia. She is also overseeing a planning field test called Headwaters to the Chesapeake Bay for the Chesapeake Bay Program and the Environmental Protec-  
(See Annual Meeting, page 8)



Annual Meeting (Sept. 16 -18)  
Registration materials inside







## From the president . . . . .

### *VNPS field trips prove successful*

Dear VNPSers,

Once again, we are planning for our Annual Meeting, and all the details are included in this issue. My deepest thanks go out to the Prince William Chapter for the work they are doing to host the meeting. I'm sure we are all in for a great weekend.

I would also like to thank all of the board members who work on behalf of the society, and especially those being elected this fall. You will find names and information about the generous individuals standing for office in this newsletter. We've got a great group running the organization.

My focus lately has been our travel schedule, and we have had three wonderful botanical trips this spring. I send my sincere thanks to Butch and Betty Kelly for the trip on the Blue Ridge, and to Linda and Larry Wilcox for taking us to Green Swamp, N.C., and the Kansas prairies. I have so many photos I don't know what to do! The individual plant that thrilled me most on my travels was the Venus flytrap (*Dionaea muscipula*), which was in full bloom. Its native range is limited to the coastal plain of North and South Carolina within about 60 miles of Wilmington, N.C. It has either been planted or naturalized in wet areas in Florida and New Jersey. On

the Blue Ridge, the magnificent flame azalea (*Rhododendron calendulaceum*) was special, and the elevation changes and going in and out of spring produced a wide variety of plants in bloom. My favorite Kansas plant would have to be the butterfly milkweeds (*Asclepias tuberosa*) on the prairies. We noticed the color range from yellow-orange to nearly red previously, but this year we also visited a sand prairie where the blooms were yellow. Close encounters with bison made for another highlight!

This is a first for our filling all available spaces on the trips so quickly. While the success is wonderful, I feel bad that not everyone who wanted to go got a space. All of our trips are limited, if not directly by housing opportunities in out-of-the-way places, then by the number of people who can be accommodated on the tour sites. Next year we plan to try a policy of not signing anyone up until the trip's registration date has been officially announced in the Bulletin, usually in the winter, and a deposit received.

Well, now it's back to summer in Virginia, and I look forward to every day in our mountains, woods, and fields! I hope I'll see a lot of you at the Annual Meeting.

*Your President, Sally Anderson*

## *Conway Robinson history revealed in early wildflower journal*

A package addressed to the VNPS office arrived in 2004. Upon opening the package, we discovered a collection of journals published by The Wild Flower Preservation Society, Inc. (WFPS). We are grateful to have received this collection because in the journals is an interesting history of an early organization created with the mission of protecting and preserving our native plants. Our set begins in January 1937 when the offices of the early botanical group were at 3740 Oliver St., N. W. Washington, D.C. At that time, the Wild Flower Pres-

ervation Society called for a Wild Life Conference to include wild plants and stated that the new group's perspective on that term was that "Wild Life, like the term Biology, applies as much to plants as to animals."

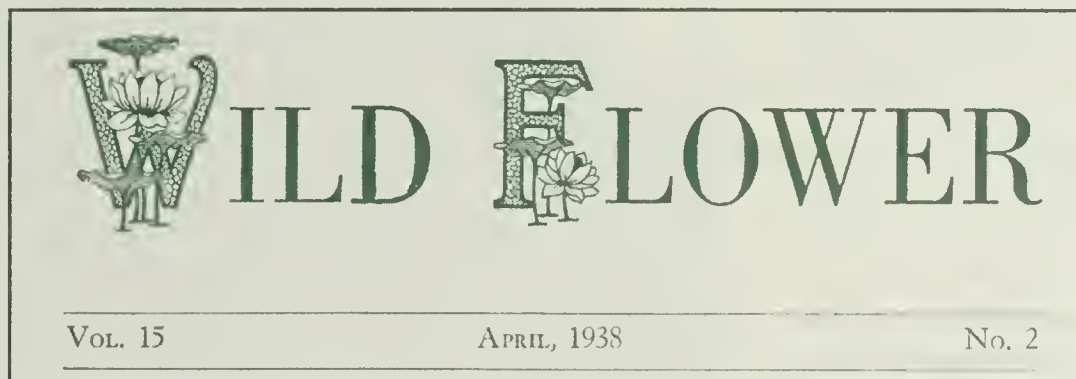
The collection concludes with the last issue of the journal, published October 1944 (Vol. 21 No. 4) with the following announcement: "Wild Flower Magazine Will Be Discontinued Until After The War." [signed] P.L. Ricker, Editor; Associate Editors Clara M. Cheatham, Helen N. Upson, G. R. Fessenden and Dr. E.T. Wherry.

The Library of Virginia has expressed a desire to receive the collection from VNPS in order to preserve the original journals and digitally scan them so that they are available for study.

Readers might be able to make a modern connection to the wildflower editorial about the Conway Robinson Memorial Forest in the April 1938 issue of the WFPS journal. The entire article is found on the next page.

*Nicky Staunton  
VNPS First Vice-President.*





# EDITORIAL

## A NEW WILD FLOWER PRESERVE

On March 19 [1938], there was given to the Virginia State Conservation Commission a tract of about 400 acres, about three fourths of which is woodland, to be known as the Conway Robinson Memorial Forest. The land was donated by Miss Agnes Robinson in memory of her father, who was a distinguished Virginia attorney, and is located near Gainesville, Va. It is the desire of the donor that the wooded portion serve as a sanctuary for wild flowers and birds and she has asked that representatives of the Wild Flower Preservation Society and the Audubon Society cooperate with the Commission, to be represented by the Virginia State Forester and perhaps others in the development of the place.

The growth is largely Oak, of which about 100 or more of the trees are about four feet in diameter. A much larger number are from twelve to fifteen inches in diameter, with a scattering of smaller deciduous trees, two species of pine and Red Cedar.

One hundred roots of the large Snow Trillium and fifty roots each of a dozen other attractive native wild flowers have already been planted with a fund provided by the Conway Robinson Memorial Association, through which Association the conveyance of the land was made. It is expected that nature trails will be laid out later and it is probable that the one hundred acres of open land will be used for a demonstration forest.

A survey of the plant life of the area is being made by several members of the Wild Flower Preservation Society as a preliminary to the planning of the nature trails. No roads will be constructed, or automobiles permitted in the Preserve except at one parking area near the main highway.

## Horticulture course slated for early 2012

The 42nd annual Mid-Atlantic Horticulture Short Course, one of the nation's most comprehensive horticulture education programs, will be held Jan. 29-Feb. 2, 2012, in the Marriott at City Center in Newport News, Va.

The four-day conference is divided into industry-specific tracks, and participants can mix and match subject areas. National and regional speakers present new techniques, university research and advances in arboriculture, business, work crew management, horticulture skills, landscape architecture and design, landscape management, pesticide training and recertification and plants and production. Hands-on workshop topics include bonsai, landscape design, plant propagation and insect identification (with microscopes) for basic and beneficial insects. The course allows participants to qualify for many industry continuing education credits and certifications.

Programs and registration forms will be available in the fall. More information is available from [www.mahsc.org](http://www.mahsc.org) on the event's Facebook page or by calling 757-523-4734. The course is produced by the Virginia Horticultural Foundation that provides educational programs to inform the general public and professionals in effective and efficient horticultural pursuits, landscaping, environmental concerns and gardening activities.

## SNP volunteers fight back against invasive plants

Shenandoah National Park is home to beautiful and diverse native plant life. Introduced into an ecosystem, non-native plants (also known as exotic or alien species) become invasive when they spread quickly and compete against native plants for valuable resources, such as sunlight and soil nutrients. Their invasion disrupts the beneficial relationships that promote diversity, and at its worst can mark the end for species that are already rare or endangered.

Now the Shenandoah National Park volunteers are fighting back. The Volunteers-in-Parks program has arranged a series of exotic plant control workdays on Saturdays throughout the summer from 10 a.m. to 2 p.m. Workday events include hand pulling, cutting or lopping invasive exotic plant species. Shenandoah National Park will provide gloves, trash bags, loppers and any other needed equipment. Volunteers should come dressed for working

outdoors where it can be hot, humid, stormy, windy or cool. Other necessities include water, food, sunscreen and bug spray. Please be advised you may encounter poison ivy, ticks, insects, snakes and other wildlife.

Upcoming work days are July 23 (Dickey Ridge, meet at Dickey Ridge Visitor Center parking lot), Aug. 13 (Loft Mountain, meet at Loft Wayside parking lot), Aug. 27 (Big Meadows, meet at Byrd Visitor Center parking lot), Sept. 10 (Loft Mountain, meet at Loft Wayside parking lot), and Sept. 24 (National Public Lands Day, meeting place TBA).

Individuals or groups can also adopt a site in the park that is struggling under the invasion of exotic plants.

For more information about the work days or adopting a site, contact Cindy Blugerman, Natural Resources Volunteer Coordinator, at [Cindy\\_Blugerman@nps.gov](mailto:Cindy_Blugerman@nps.gov) or 540-999-3500, x3437. Pre-registration is required for plant control workdays.



# Oak galls: A strange biology indeed!

Anyone who takes the time to look closely at several branches of oak will soon find one or another peculiar anomaly among the leaves and twigs. One can easily find structures resembling Ping-Pong balls, hard knots, fluffy tufts, horns—either single or clustered, or irregular thickenings, to mention just a few possibilities. These abnormal growths are galls, structures caused by the presence of small insect larvae living inside the tissue of the plant. Galls can be found on a wide variety of plants. They are common, for example, on the stems of goldenrods, and the leaves of maples, but oaks are host to a bewildering diversity of these little parasites. As many as 400 species of gall-forming flies, wasps, and mites have been documented to occur on white oak alone; and some 700 species of gall-forming wasps have been recorded for North America. Many, but certainly not all, parasitize oaks. Some oak gall-formers are restricted to white oak (*Quercus alba*), the 2011 VNPS Wildflower of the Year, others may occur on other species within the white oak group, and still others parasitize the red/black oak group.

In many cases, galls begin to form early in the season as new stems and leaves emerge from winter buds. What seems significant about this time frame is that host tissues are already in a state of growth; many plant cells are dividing and their daughter cells are enlarging as part of normal development. Concurrently, gall insects hatch from eggs that were deposited by adult female wasps or flies, either in late winter within the dormant bud itself, or in the newly emerging stems and leaves. Somehow, the presence of the insect alters the normal course of plant development so that, within a limited radius in the vicinity of the insect, more than the usual number of plant cells are

formed and these extra cells become arranged in patterns unlike that of uninfected tissue. Insect larvae responsible for the gall can usually be found near its center. The gall provides the larva with food and protection. Usually, gall-forming parasites are described as having only a minimal negative impact on their host trees, especially if the infestation is not dense.

The spotted oak apple gall, found on leaves of white and post oaks, provides one example of gall structure. These galls are spherical and roughly the size of a Ping-Pong ball. The gall is thin-walled and its surface green with darker spots. Most of the volume of the sphere is composed of threadlike cells that radiate from a denser central mass containing the gall insect. These "oak apples" fall from the tree in autumn, and mature wasps (*Atrusca quercuscentricola*; synonym *Cynips centricola*) emerge before winter weather arrives. After mating, female wasps deposit eggs in the winter buds.

Details of how gall insects control growth of plant cells that form galls are not well understood. Secretions from the insect alter the plant's normal control of cell division and cell maturation. The secreted substances are sometimes described as "acids" or "enzymes," but such simplistic explanations are silent on what these alleged control substances do. In theory, one can imagine that insect secretions could alter gall-



Two different oak galls. Top photo by John Hayden; bottom photo by Nicky Staunton.

forming plant cells at genetic, biochemical, or physiological levels; i.e., various genes in the host plant may be turned on or off, synthesis of various plant molecules (e.g., hormones) may be enhanced or inhibited, or the cellular receptors for plant hormones may be rendered more or less sensitive. Almost certainly, control of gall growth is a complicated process, and, with equal certainty, one is tempted to assert that the details must vary depending on the taxonomy of the parasite (fly, wasp, or mite), taxonomy of the host (species of oak), location of the gall (stem, twig, or leaf), and morphology of the gall itself. In some cases, bacterial

(See *Variety*, page 5)





# VNPS 2011 Annual Meeting

Sept. 16-18, 2011

## "Wild Places in Urban Spaces"

The Prince William Wildflower Society Chapter of the VNPS invites you to the 2011 Annual Meeting of the Virginia Native Plant Society. Following on the heels of the Civil War Sesquicentennial commemorations of the First Battle of Manassas, members will gather to explore the varied flora and fauna in Virginia's only county that spans three geological provinces, from Bull Run Mountain to the coastal plain on the Potomac River. The Prince William area is historically rich and provides an exciting backdrop for hiking, canoeing, exploring the urban and rural wilds, hearing exciting speakers, and visiting with old and new friends.

*Weekend Schedule of Events (All events other than field trips will be held at the headquarters hotel, Four Points by Sheraton Manassas Battlefield):*

### Friday, Sept. 16

3-5 p.m. Quarterly Board Meeting

*Dinner on your own—many restaurants nearby (list available)*

### Evening Social

6 p.m. Registration. Chapter and state displays

7 p.m. Hors d'oeuvres and dessert (cash bar)

7:30 p.m. Welcome and opening remarks. Featured presentation by Jim McGlone, "Managing Our Forest Lands for Ecological Health." Join Jim as he gives an overview of the condition of our forests, discusses the underlying ecological functions of a forest, and describes how managing for ecological health often involves human intervention and education.

### Saturday, September 17

*Breakfast on your own*

9 a.m.-4 p.m. Field trips.

5:30-7 p.m. Social, silent auction, cash bar, and appetizers

7 p.m. Annual Business Meeting, Election

7:30 p.m. Dinner (business casual dress)

8:15 p.m. Evening program: Keynote speaker Karen Firehock, "Using Green Infrastructure Planning to Conserve Native Plant Communities" Many impacts to native plant systems are the result of poor land use planning. Changing the process to focus on obtaining good information about "green assets," ensuring habitats are connected, and identifying opportunities while engaging stakeholders can greatly improve preservation and restoration efforts and result in better quality of life for residents.

### Sunday, September 18

*Breakfast, lunch on your own*

9 a.m.-noon Field trips

### Accommodations

Four Points by Sheraton Manassas Battlefield, 10800 Vandor Lane, Manassas, VA 20109

Phone 703-335-0000, Fax 703-361-8440, Special Offers Reservations 866-716-8113

Free breakfast and wi-fi.

<http://www.starwoodhotels.com/fourpoints/property/overview/index.html?propertyID=1730>

*Registration prior to August 31 ensures \$99 advertised room rate. When making your reservation, make sure that you give the VNPS Reservation Code ANP: 16.*

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## Field Trips

Field trips begin at 9 a.m. Box lunches from Panera will be provided. Trips are full-day or half-day. Some trips have additional fees as noted. Field trip attendance limits are 20 unless otherwise noted. Programs are rain or shine except for the kayak/canoe trip.

On the registration form **INDICATE** your field trip preferences. Please mark a first and second choice. For field trip questions, contact Charles Smith ([chrissmith@msn.com](mailto:chrissmith@msn.com)); for all other information, contact Karen York (540-837-1600 or [vnpsoc@shentel.net](mailto:vnpsoc@shentel.net)). Information and directions on where and when to meet for each trip will be sent out with your Annual Meeting Confirmation Packet and will also be available at the Friday evening program.

### SATURDAY FULL-DAY FIELD TRIPS

1 Bull Run Mountain (Moderate to Strenuous, limit 25) This unique, outlying mountain range plays host to 1,016 species of plants and 112 species of lichens (formally documented) in 11 major plant communities. Some of the plants are disjunct from the higher mountains to the west, including black ash (*Fraxinus nigra*), Goldie's wood fern (*Dryopteris goldiana*), slender mannagrass (*Glyceria melicaria*), staghorn clubmoss (*Lycopodium clavatum*), round-leaf orchid (*Platanthera orbiculata*), great rhododendron (*Rhododendron maxima*), northern starflower (*Trientalis borealis*), American false hellebore (*Veratrum viride*), nodding trillium (*Trillium cernuum*) and table mountain pine (*Pinus pungens*). The 2,846 acres of Bull Run Mountain are now designated a DCR-Division of Natural Heritage Natural Area Preserve, with 8 rare plant communities. Visit [www.dcr.state.va.us/dnh/bullrun.htm](http://www.dcr.state.va.us/dnh/bullrun.htm) and [www.brmconservancy.org](http://www.brmconservancy.org).

2 Manassas National Battlefield Park Flora and Civil War History (Moderate) \$3 park entry fee without annual pass. This 5,000-acre national park has three VNPS Registry sites and contains unusual plants such as blue-hearts (*Buchnera americana*), marsh hedge-nettle (*Stachys pilosa* var. *arenicol*), buffalo clover (*Trifolium* sp.), Appalachian quillwort (*Isoetes appalachiana*), and hairy beardtongue (*Penstemon hirsutus*). Manassas battlefield was the site of two important Civil War battles. The stories of the soldiers and civilians who fought and died here are a compelling part of our heritage. Visit <http://www.nps.gov/mana/> and look under Park Resources, Nature & Science to view species lists.

3 Silver Lake Park & The Winery at La Grange (Moderate, limit 25). Vineyard tasting \$10. The group will visit Silver Lake Regional Park in the morning, which features a 20-acre lake fed by the Little Bull Run and an abandoned diabase quarry. The diabase-derived soils support two globally rare plant communities: Northern Hardpan Basic Oak-Hickory Forest and Pin Oak-Swamp White Oak Upland Depression Swamp. The group will drive just a few miles down the road at mid-day to eat lunch at the Winery at La Grange. The winery opened in September 2006 and is situated around red brick three-and-a-half story La Grange manor house built in the 1790s. There will be a wide selection of wines and a wonderful setting to eat, drink, and visit with friends. Visit <http://www.pwcparks.org> and <http://www.wineryatlagrange.com>

### SATURDAY HALF-DAY FIELD TRIPS AND WORKSHOP

4 Occoquan Bay National Wildlife Refuge; Morning (Moderate) This trip is ideally paired with Featherstone NWR in the afternoon. The 643-acre Occoquan Bay National Wildlife Refuge, formerly the U.S. Army Woodbridge Research Facility, is noted for its upland meadows with warm season grasses and for the wetlands on the shore of the Occoquan River near its confluence with the Potomac. Twenty plant communities support 700 species of plants that in turn support an inventory of 265 bird species. Northern harrier, bald eagles, rails, migrating birds all use the habitats of the refuge, part of the USFWS Potomac River Refuge Complex. Visit <http://northeast.fws.gov/va/mro.htm>.

5 Featherstone National Wildlife Refuge; Afternoon (3 hours) (Moderate) This trip is ideally paired with Occoquan Bay NWR in the morning. Featherstone NWR is 325 acres including upland hardwood forest and vast tidal wetlands. Participants will get a rare glimpse of this refuge that has been closed to the public since its acquisition in the 1970s. The refuge includes state rare species as well as some of the best remaining forested and emergent tidal wetlands in the region. Visit <http://www.fws.gov/featherstone>.

6 Occoquan Reservoir Kayak-Canoe Trip; Morning (3 hours) (Moderate) Kayak or canoe rental about \$26 or you may bring your own and pay the \$5 launch fee. Occoquan Reservoir is a 2,100-acre Fairfax Water Authority impoundment, which forms the boundary between Fairfax and Prince William Counties. Although known throughout Virginia for its fishery, the reservoir also plays host to diverse wetlands and terrestrial plant communities and a wide array of bird species. Join botanists and historians with special assistance from the Occoquan Water Trail League in exploring this unique place the best way possible, from the water. Visit <http://www.nvrpa.org/park/fountainhead>.

7 Wetlands Studies & Solutions Inc. Building Tour; Morning (2 hours) (Easy, limit 25) This trip is ideally paired with the Conway Robinson State Forest in the afternoon. The Wetlands Studies and Solutions Inc. (WSSI) headquarters in Gainesville, Va., is one of the first Leadership in Energy and Environmental Design (LEED) Gold facilities in the mid-Atlantic. This unique structure incorporates numerous resource saving and Low Impact Development (LID) design features. Join a WSSI staff member and learn more about energy-saving features, the green roof, porous asphalt and concrete, rain garden and cisterns that allow rainwater to be reused to irrigate plantings and flush toilets. Visit <http://www.wetlandstudies.com/about-wssi/office-docs/WSSIBrochure4thEdition.pdf> and <http://www.wetlandstudies.com/about-wssi/wssi-office.html>.



8 \_\_\_ **Conway Robinson Memorial Forest, Virginia Department of Forestry; Afternoon** (Moderate, limit 25) This trip is ideally paired with the Wetlands Studies and Solutions Inc. Headquarters building tour in the morning. Conway Robinson Memorial Forest contains 440 acres bordered by Rt. 29 at I-66, Heritage Hunt development, Little Bull Run and is near Manassas National Battlefield Park. It features hardwood and pine forests on a bedrock outcroppings. A gas line forms an open meadow and hosts *Gentiana clausa*, *Gerardia tenuifolia*, *Krigia* dandelion, and *Liatris squarrosa*. Autumn brings *Corallorhiza odontorhiza* blooms. A forest stewardship center has been proposed for the site. Visit <http://www.dof.virginia.gov/stforest/index.htm>.

9 \_\_\_ **Introduction to Nature Photography; Morning** (3 hours) (Easy) In this workshop you will learn how to use the various settings on your camera to get more interesting and unique photos of nature subjects. We will also discuss accessories and equipment that can be used to improve your results and learn a little about post-processing with Photoshop or similar image editing programs. The workshop will include fieldwork at several sites at Merrimac Farm Wildlife Management Area and a chance to practice and to compare your work. Merrimac Farm has a variety of habitats including wetlands, meadows, and upland forest. Visit <http://www.pwconserve.org/merrimacfarm/index.htm>.

10 \_\_\_ **Introduction to Nature Journaling; Afternoon** (3 hours) (Easy) Would you like a relaxing way to enjoy nature? You don't have to climb mountains or slog through wetlands to experience and appreciate nature in this workshop. Learn the techniques of nature journaling during a session at and around the Stone House at Merrimac Farm Wildlife Management Area, a particular hotspot for butterflies. Visit <http://www.pwconserve.org/merrimacfarm/index.htm>.

### SUNDAY FIELD TRIPS

11 \_\_\_ **Manassas National Battlefield Park Flora Walk** (3 hours) (Moderate, see park description above).

12 \_\_\_ **Manassas Airport Wetlands Mitigation Birding Walk** (3 hours) (Easy) The Route 234 Wetland Mitigation Area near Manassas Airport is 89 acres of forested and emergent wetlands protected by an upland corridor. This former farmland site was developed in 2000 by VDOT to replace wetlands and wildlife habitats lost to the construction of the Route 234 Bypass. Original plantings included a variety of shrubs and hardwood trees adapted to wetland conditions: red maple, sycamore, pin oak, willow oak, green ash, button bush and black willow. A variety of rushes and sedges were planted, along with wildflowers such as hibiscus. Preserving both upland and wetland habitats, it is quickly becoming a refuge for wildlife in a rapidly developing area.

13 \_\_\_ **Bristoe Station Battlefield Meadow Walk** (2 hours) (Moderate, no limit) Set aside to protect a portion of the Oct. 14, 1863, Battle of Bristoe Station site, this 127-acre county park also provides important piedmont meadow habitat. Participants will discuss meadow management while observing meadow plant species and a diverse array of birds, including eastern meadowlark and grasshopper sparrow. Visit [www.pwconserve.org/issues/landuseplanning/bristoe/index.html](http://www.pwconserve.org/issues/landuseplanning/bristoe/index.html).

Please take full advantage of all the other wonderful public and private activities and events in the Prince William area. Many can be found at <http://www.visitpwc.com>.

### About our Guest Speakers

**Jim McGlone** is an urban forest conservationist with the Virginia Department of Forestry, serves on the Fairfax County Tree Commission, and is a chapter advisor of the Fairfax Master Naturalists. He assists private and public landowners in assessing their properties and developing land management strategies. He also gives presentations to diverse audiences on ecology and related topics and participates in developing and implementing local policies that protect and enhance natural resources.

**Karen Firehock** is director and co-founder of the Green Infrastructure Center, and is an adjunct at the University of Virginia teaching graduate courses in green infrastructure planning, watershed planning and stormwater management, global health and environmental ordinances, and fundraising. Visit <http://www.arch.virginia.edu/faculty/KarenFirehock> and <http://www.gicinc.org/staff.htm>.

### Silent Auction

Each VNPS Chapter will be providing items for the Silent Auction. Proceeds benefit VNPS. Bidding opens at 5 p.m. on Saturday at the Center for the Performing Arts and closes at 6:30 p.m. Cash, credit, or personal checks accepted. Winners will be announced at the meeting. Sponsors and patrons will be recognized.



**Registration Form**  
**"Wild Places in Urban Spaces"**

Virginia Native Plant Society 2011 Annual Meeting  
Sept. 16-18, Four Points by Sheraton Manassas Battlefield, Manassas, VA

Name \_\_\_\_\_ Phone Number \_\_\_\_\_

Second person in your party \_\_\_\_\_ Cell Number \_\_\_\_\_

Street \_\_\_\_\_ City, State, Zip \_\_\_\_\_

Email \_\_\_\_\_ (2nd person's)

Signature\* \_\_\_\_\_ (required) Signature\* \_\_\_\_\_ (required)

*\*Signatures required on all registrations. By signing this form the above registrant shall hold harmless the Virginia Native Plant Society, including its staff and volunteers and those designated to serve as their provider.*

\* \* \* \* \*

***Registration closes Thursday, August 31. Please register early for adequate event planning.***

Number attending: \_\_\_ VNPS members \_\_\_ Non VNPS family member \_\_\_ General Public  
\_\_\_\_\_ Total Attending

*Enclosed registration fees # \_\_\_\_\_ x \$85 (Includes all events: Friday night speaker and refreshments, field trips, speakers, Saturday box lunch, Saturday banquet, and speaker). Please include an additional \$26/person for kayak rental for Occoquan Reservoir Trip if you need to rent a boat. Please include an additional \$10 for non-VNPS family members and an additional \$30 (VNPS membership) for non-members from the general public.*

\_\_\_\_\_ Total Amount Enclosed

**FIELD TRIP SELECTION** (Use trip numbers next to descriptions)

**Please note:** All field trips are limited to 20 participants unless otherwise stated. Please see each description for details and possible additional fees (rentals, entrance fees, etc.). You may do a Saturday a.m. walk and a p.m. walk. If registering for more than one person, put the number of people under each choice.

**Saturday a.m. Field Trips:**

1st choice \_\_\_\_\_

2nd choice \_\_\_\_\_

**Saturday p.m. Field Trips:**

1st choice \_\_\_\_\_

2nd choice \_\_\_\_\_

**Saturday All Day Field Trips:**

1st choice \_\_\_\_\_

2nd choice \_\_\_\_\_

**Field Trip Box Lunch Choices - (Circle One)**

- Napa Almond Chicken Salad on Sesame Semolina
- Bacon Turkey with Gouda on Tomato Basil Bread
- Italian Combo on Ciabatta Bread
- Roast Beef on Asiago Cheese Demi Bread
- Mediterranean Veggie on Tomato Basil Bread

**Sunday Field Trips:**

1st choice \_\_\_\_\_

2nd choice \_\_\_\_\_

**Saturday banquet:** (Fee for attending banquet only is \$48)

Beef medallions with cognac sauce \_\_\_\_\_

Peppered encrusted salmon with butter sauce \_\_\_\_\_

Cheese-filled tortellini with marinara sauce \_\_\_\_\_

Meal notes (vegan, allergies, etc.) \_\_\_\_\_

**Check  
dinner  
choice**

*For more information  
Contact VNPS office  
manager Karen York at  
540-837-1600  
or vnpsoc@shentel.net*

**Want to pay by credit card?** Circle one Discover, Mastercard, Visa

Card number \_\_\_\_\_ Exp. date \_\_\_\_\_ Security Code \_\_\_\_\_

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**Mail this form (with check payable to VNPS or credit card information) to:  
VNPS Annual Meeting, 400 Blandy Farm Lane, Unit 2, Boyce, VA 22620**



# •Variety in galls is huge

(Continued from page 4)

symbionts or viral parasites of the gall-forming insects have been reputed to play a role in gall formation. Regulation of gall development should be a fertile area for research.

Many oaks, of course, are deciduous; it follows that insects forming leaf galls in deciduous oaks necessarily complete their life cycles within a single year, as described above for the oak apple gall. On the other hand, stems and twigs are perennial, and galls that form on these organs can harbor insects with longer life cycles, up to three years in some cases. In another life cycle variation, some insects start their life on leaves, emerging from leaf galls as larval instars that then infect twigs of the same plant where they form yet another gall (stem gall) before completing their development. The wasp that makes oak fig galls inhabits twigs and roots in alternate life-cycle stages.

It is a given that normal plant structure is altered in the formation of galls. Chemistry, too, can be altered, and in the case of oaks, galls often contain higher than usual concentrations of tannins. In fact, tannin-bearing stem galls from several species of oak have a long history of use in making ink. The recipes vary in detail, but require extracts of gall tannins to be mixed with solutions of ferrous iron ( $Fe^{2+}$ ) in the presence of a binder substance (usually gum arabic). The resulting ink is initially somewhat pale, but it gradually darkens to an intense purplish black that adheres very well to paper, vellum, or parchment. Unless neutralized, however, the acidity of oak-gall inks can degrade the writing surface. Galls from several European oaks (*Q. robur*, *Q. petraea*) are most prominent in this regard. Tannins from the gall oak (*Q. lusitanica*) of the Iberian Peninsula and

Morocco are well known as sources of black dyes, and Native Americans had similar uses for oak galls from various species in North America.

Returning to natural themes, the ecology of oak galls often extends beyond direct interaction between insect and tree. Depending on the gall and its stage of development, some are eaten by wildlife. For example, certain small twig galls found on white oak are eaten by field sparrows and goldfinches in winter. More bizarre, however, are the surprisingly numerous hyperparasites, generally wasps that prey upon different species of gall-forming insects while resident inside their gall. The hyperparasitic female wasp has a long ovipositor with which she inserts her egg directly into the center of the gall; the egg hatches and the hyperparasite consumes the insect that formed the gall. How galling it must be for the gall insect to have its elaborate defenses breached! One is reminded of a famous bit of doggerel by Jonathan Swift, "So, naturalists observe, a flea has smaller fleas that on him prey; and these have smaller still to bite 'em; and so proceed *ad infinitum*."



There is no doubt about it, the web of life is intricate. Next time you enjoy the shade of a spreading oak tree, keep an eye out for oak galls and marvel for a moment about the complexity of the world we inhabit.

*John Hayden, VNPS Botany Chair*  
The author claims no special expertise in the biology of plant galls. The overview presented above was distilled from several sources found on the Internet, which will serve as a good starting point for anyone wishing to pursue the subject further. Websites of Agricultural Extension Services of several states in the eastern U.S. were found to be particularly useful. Any errors in the above, however, should be attributed to me. WJH.

Top photo, Leaf galls on white oak (*Quercus alba*); scale bars equal 1 mm. Below that is a wool sower gall and an oak apple gall, bottom. Top photo John Hayden and bottom two photos Nicky Stannton.



# New book on Appalachian plant communities a useful source

*Wildflowers & Plant Communities of the Southern Appalachian Mountains & Piedmont* by Timothy P. Spira

This plant guide organizes plants into 21 communities occurring in the southern Appalachians and Piedmont. Contrary to the title, it covers not only wildflowers, but 340 trees, shrubs, herbaceous plants, and ferns found in the region. The plant communities are described in detail, ranging from High Elevation/Spruce-Fir Forest to Piedmont/Roadside and Field. The largest section of the book is Species Profiles, which covers description, habitat, taxonomy, ecology and uses of the 340 species.

I took this book along on a trip to the Appalachian Trail (AT) in Giles County. On Salt Pond Mountain, I tried to identify a known "unknown" using this community approach. I failed. Either I couldn't identify the plant community—it looked like high-elevation red oak forest to me—or the halberd-leaved violet didn't know where it was supposed to be. This book is not your best bet for an identification guide, but identification is just the first step. The next step is learning how plants fit into communities. A privilege of living in the Appalachians is that a day's hike or an hour's drive takes us through a handful of different, distinct plant

communities, and all are described here.

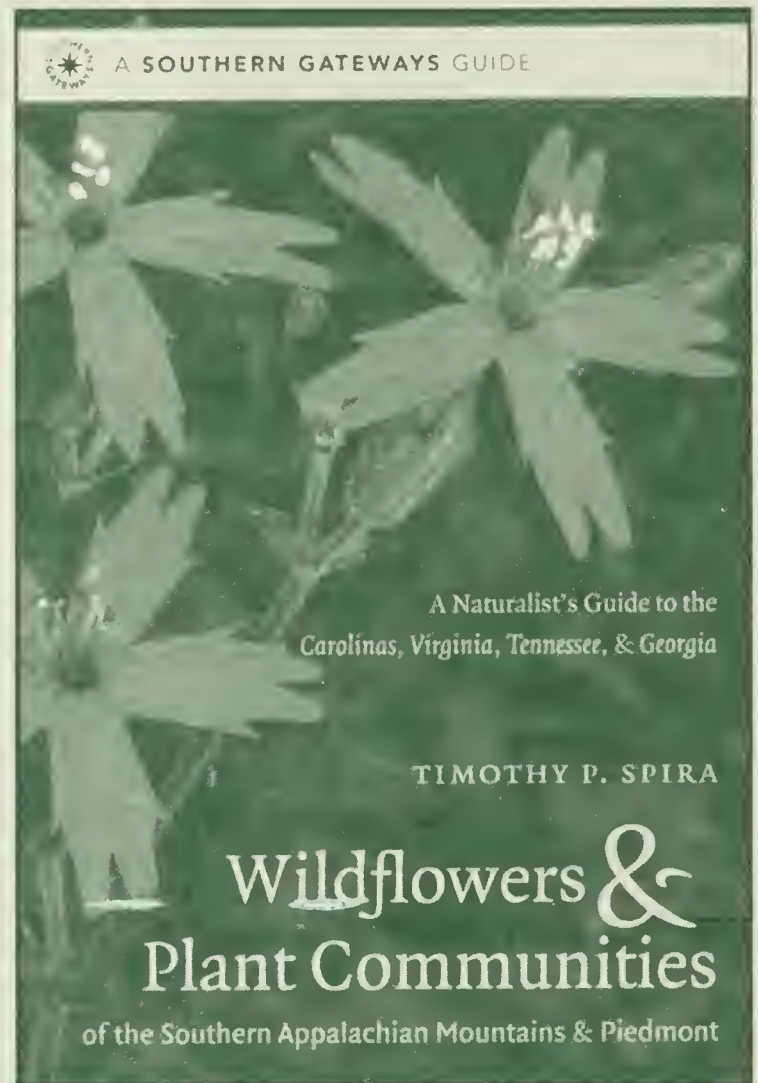
I liked the community descriptions, with distinguishing features, seasonal aspects and plant lists. They put me in mind of the classic *Deciduous Forests of Eastern North America* by E. Lucy Braun. The photographs, by the author, are technically adept, with lighting that isolates the featured plants from distracting backgrounds. The Species Profiles give more than leaf arrangement and number of petals, delving into natural and human history and wildlife use of the plants described. Finally, this book made me confront the changes in nomenclature that have taken place since the Peterson and Newcomb's guides and my beloved *Flora of West Virginia* were published.

Author Timothy Spira is a botany professor at Clemson University. His home turf seems to be the high mountains and balds of North Carolina, but the book is applicable to our region as well, and Johnny Townsend, a staff botanist with the Division of Natural Heritage of the Virginia Department of Conservation and Recreation, was a contributor. On my visit to Giles County, I met an AT

through-hiker, a Clemson retiree, who knows Dr. Spira and endorsed him warmly.

At a beefy 520 pages, this book won't go in my backpack, but it will go with us in the car and be a home reference. Anyone who is ready for the next step after identification will enjoy this book.

Mark Gatewood  
Shenandoah Chapter



## Trees and trains partnership aids in reforestation projects

Underscoring its leadership in "conservation capitalism"—the growing understanding that environmental progress and American business are closely linked—Norfolk Southern (NS) signed a \$5.6 million, five-year reforestation and carbon sequestration agreement with GreenTrees LLC and

planted a ceremonial first tree at the Rick Lowery Farm in Yazoo City, Mo., recently.

Under the program, NS and GreenTrees® will plant 6.04 million trees on 10,000 acres in the Mississippi Delta area served by the railroad, significantly offsetting the company's CO<sub>2</sub>

emissions while creating a national environmental legacy.

GreenTrees is the leading reforestation program on private lands in the United States today. Recognized as one of the most innovative developments in the fight to revitalize the nation's

(See Reforestation, page 7)



# • Reforestation

(Continued from page 6)

ecological health, GreenTrees is at the cutting edge of the new industrial revolution—making conservation a business.

The NS-GreenTrees program calls for planting native hardwoods and cottonwoods on privately-owned acreage in Mississippi and Louisiana. The land is in a region served by NS and its predecessors since the earliest days of railroading in the U.S. To put it in perspective, the plantings will represent 211 trees for every NS employee, 299 trees for every mile of NS track, or 1,450 trees for every NS locomotive.

Chandler Van Voorhis, GreenTrees managing partner, added, "We take one acre at a time and compress time and space to accelerate forest growth by six to eight times in the critical first fifteen years, creating an ecologically healthy and permanent forest in an area that is central to our national ecosystem interests."

Over time, the trees should deliver more than a million carbon offsets. Restoration will support the commercial, climate, and energy interests served by America's longest river. At the same time, it will protect wildlife habitats, improve water quality, and forestall soil erosion and nutrient run-

off. The trees will be planted on private tracts under long-term leases.

The announcement complements other components of Norfolk Southern's carbon mitigation strategy, including partnerships and financial support for non-profits and coordination and collaboration with government and non-government organizations.

In 2008, for example, NS permanently protected some of the most ecologically significant land in the world when it granted a conservation easement on 12,488 acres of its Brosnan Forest timber and wildlife preserve northwest of Charleston, S.C. The easement, one of the largest in the Southeast and the largest ever by a corporation in South Carolina, protects the dwindling longleaf pine ecosystem and endangered bird species, preserves forever the rural character of the area, and conserves the

Four Holes Swamp ecosystem and Edisto River watershed.

Relatedly, NS is supporting research by the Longleaf Alliance, which seeks to restore the tree's forest ecosystem. The longleaf pine once dominated the landscape of the South and to some extent even its culture, occupying 90 million acres in nine southeastern states. Over-exploitation has reduced that footprint to 3.5 million acres—a loss comparable to that experienced in tropical rain forests, redwood forests, or America's wetlands.

NS also supports the American Chestnut Foundation in its efforts to reintroduce that tree species to native forests. Before being decimated by blight, the American chestnut was an integral part of the lumber economies of many eastern U.S. communities, and it was a key source of food for wildlife.

## Paint Bank field trip offered by BRWS

The Blue Ridge Wildflower Society will travel to Paint Bank in the mountains of Craig County on Saturday, Aug. 20. Participants on the day-long trip should see grass-of-Parnassus, purple fringed orchid, cardinal flower and more. The group will stop at a wetland along the way. For more information, contact Rich Crites at 540-774-4518. Participants will enjoy an early dinner at the Swinging Bridge Restaurant in Paint Bank before heading home.

See the address label for your membership expiration date

### VNPS Membership/Renewal Form

Name(s) \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

\_\_\_ Individual \$30

\_\_\_ Student \$15

\_\_\_ Family \$40

\_\_\_ Associate (groups) \$40\*

\_\_\_ Patron \$50

\_\_\_ Sustaining \$100

\_\_\_ Life \$500

\*Please designate one person as delegate for Associate membership

To give a gift membership or join additional chapters: Enclose dues, name, address, and chapter (non-voting memberships in any other than your primary chapter are \$5)

I wish to make an additional contribution to \_\_\_ VNPS or \_\_\_\_\_ Chapter in the amount of \_\_\_ \$10 \_\_\_ \$25 \_\_\_ \$50 \_\_\_ \$100 \_\_\_ \$(Other) \_\_\_\_\_

\_\_\_ Check if you do not wish your name to be exchanged with similar organizations

\_\_\_ Check if you do not wish your name to be listed in a chapter directory

Which chapter do you wish to join? (See [www.vnps.org](http://www.vnps.org)) \_\_\_\_\_

Paying by credit card? \_\_\_ MC \_\_\_ Visa \_\_\_ Discover Exp. date \_\_\_\_\_

Card # \_\_\_\_\_ Security code \_\_\_\_\_ Signature \_\_\_\_\_

Make check payable to VNPS and mail to:

**VNPS Membership Chair, Blandy Experimental Farm, 400 Blandy Farm Lane, Unit 2, Boyce, VA 22620**

Membership dues are tax deductible in the amount they exceed \$5. Contributions are tax deductible in accordance with IRS regulations.

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Sally Anderson, President  
Nancy Sorrells, Editor

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# Annual Meeting features diversity of habitats

(Continued from page 1)

tion Agency's Healthy Watersheds Initiative. She helped the Virginia Department of Forestry create its five-year strategy and is currently field testing the state's InForest Model to review the nitrogen, phosphorus and sediment loadings to watersheds under different development scenarios. Her skills include teaching, research, land use planning, environmental assessments, water quality monitoring, mediation and facilitation, fundraising, writing and photography.

Field trips Saturday and Sunday will allow participants to explore the diversity of flora and fauna in Prince William County—Virginia's only county that spans three geologic provinces, from Bull Run Mountain to the coastal plain on the Potomac River. Participants can choose from trips that will allow them to reminisce on last year's mountainous venue by hiking in the Bull Run Mountain Natural Area Preserve; go back in time while exploring the natural and cultural history of Manassas National Battlefield Park 150 years after the First Battle of Manassas; or visit the state's newest and north-



ernmost wildlife management area, Merrimac Farm, in Nokesville.

The town of Occoquan's website includes the following information: "Occoquan is derived from a Dogue Indian word meaning 'at the end of the water.' It is believed that the Dogues stayed close to the Occoquan River because of the abundance of fish and ease of traveling by canoe." Participants in the Occoquan River field trip will follow the path of Native Americans and early explorers by canoe and kayak while observing the diverse flora found along this unique riparian corridor.

The trip to Featherstone National Wildlife Refuge will allow participants

a unique opportunity to explore a Potomac River refuge that has been closed to the public for 40 years. Featherstone contains a diverse complex of tidal and non-tidal freshwater wetlands and associated uplands that is currently being inventoried by members of VNPS and other groups in partnership with refuge staff.

Please join us for these and other exciting field trips, speakers, a Saturday night banquet, and social events with fellow society members. A complete listing of events for the annual meeting and registration information are included in this issue of the *Bulletin*.

Charles Smith, PWWS

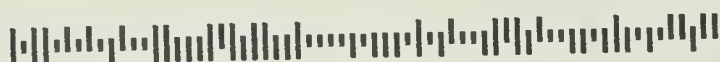
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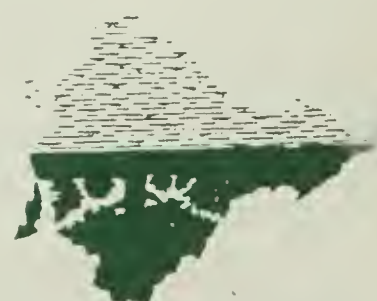


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# Bulletin

A publication of the VIRGINIA NATIVE PLANT SOCIETY

Conserving wild flowers and wild places

<http://www.vnps.org>

## Parkway botany thrills VNPSers

On May 15, a rainy Sunday, 14 of us gathered at the Peaks of Otter lodge to join Butch and Betty Kelly as they shared with us the wildflower treasures of the Blue Ridge as part of a state VNPS field trip. Our leader the first day was Rich Crites, retired professor of biology and current president of the Blue Ridge Wildflower Society. We drove north to Flat Top, and, typical of wildflower folks, found two dozen species without leaving the parking lot! Once up the trail, we were met with a profusion of green violets (*Hybanthus concolor*). Driving up to the highest point on the Blue Ridge Parkway (3,950 feet), we passed huge stands of interrupted fern (*Osmunda claytoniana*). Rich and Butch had the uncanny ability to pull over on the drive and direct us into a thicket to see one lone orchid (*Cypripedium acaule*) blooming. Amazing!

Rich took us to a place where pirate bush (*Buckleya distichophylla*) had been introduced from Poor Mountain. Rare in the South, this parasite that is found on the roots of *Tsuga* spp., was thriving in its new location, and we considered the eth-

ics of its having been moved. Later we climbed hand over hand up a steep hillside to see turkey beard (*Xerophyllum asphodeloides*).

On Tuesday we drove south in the rain, with Butch revealing his considerable knowledge of Blue Ridge topography. At the Great Valley Over-

look, we could see a part of the valley that stretches from Pennsylvania to Tennessee and realized that we were part of a much larger geographic picture. Once again, we did not have to go far from the parking area to be delighted. The tiny but robust thyme-

(See *Botanizing*, page 3)



Participants in the VNPS field trip to southwest Virginia gather on a shaded trail to learn about the ecosystems of the Blue Ridge Mountains. (Photo by Sally Anderson)

## Discover our VNPS Registry Sites

### Pages 4 , 5, & 7





## From the president . . . . .

### VNPS field trips prove successful

I've been fortunate to see flora in several parts of the country this year. Besides our VNPS trips, I visited the north central part of New Mexico. While it was quite dry and hot, the Virginia temperatures were higher that week. Seeing the (contained) Los Alamos fire on the distant mountain was impressive, and the National Forests were closed for a while because of the extreme fire danger. Luckily, there was some rain in the mountains and the forests opened to hikers. Still there were wildflowers on the trails!

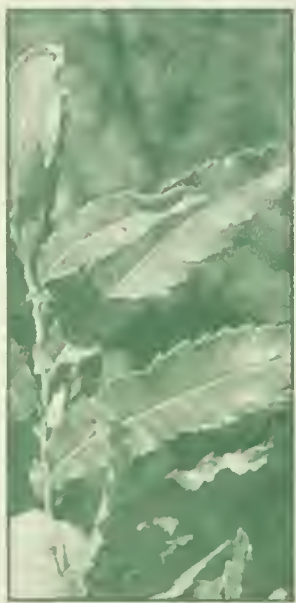
At the end of July I had the privilege of meeting with representatives from native plant societies from the southeastern U.S. I joined representatives from Florida, North Carolina, Kentucky, Texas and Georgia to discuss program ideas, communications between our groups, and issues on which we might want to join forces. This is the second year that the group has met. Last year we were represented by our Conservation Chair, Mary Ann Lawler. I hope the group will continue to meet, because I felt lucky to get to know experienced people from around the region and to hear their thoughts. We chose a couple of invasive plant issues to focus on; the first was to provide comments on the new U.S. Forest Service plan for invasive plants. I would not have been alerted to the issue in time to comment without this group of people, and was happy to get their take on it. We felt the plan was extremely thorough and well stated, with important inclusions like prevention, early detection, rapid response, and working with adjacent landowners. It's a happy occasion to write a letter that says "we like what you are proposing"!

The other invasive issue we chose to address is the growing and selling of sawtooth oak (*Quercus acutissima*) by some of our state forestry departments. This plant is on a number of invasive lists, albeit with a low ranking for invasiveness, but we felt it was a matter of time before it became more serious. We hope to present all the departments still selling this tree with a fact sheet and examples of states that have stopped supplying it. Through these efforts we hope to convince them to stick to our many native oaks. The meeting also gave me the opportunity to see a stretch of the Blue Ridge Parkway in North Carolina that I had never seen, and it was a comfortable 75 degrees with gorgeous mountain vistas. It felt like a taste of fall.

I hope you all have not been broiled yet, and that we have some cooling and rain before we meet in September.

*Your President, Sally Anderson*

### Learn more about the Asian native, sawtooth oak



The fast-growing sawtooth oak (Fagaceae, *Quercus acutissima*) is touted by some as a good wildlife food source, but others believe that it has the potential to disrupt Virginia's ecosystems.

**Leaf:** Alternate, simple, lanceolate in shape, 3-7 in long, pinnately veined with a very sharply serrated margin, the teeth tipped with bristles. Strongly resembles a *Castanea* leaf.

**Flower:** Male catkins are golden and pendent, appearing in the spring; female catkins are borne on spikes, appearing with the leaves.

**Fruit:** Acorns are oval in shape. Cap covers half of nut with scales very prominently reflexed, resembling hair. Among the first acorns to ripen in the fall after two years on the tree.

**Twig:** Quite slender, red to gray-brown with multiple terminal buds; buds are gray-brown, pubescent on the bud scale edges and somewhat pyramidal.

**Bark:** Ridged and furrowed even when young, later deeply ridged and furrowed, somewhat corky.

**Form:** A small to medium-size tree that forms a dense pyramidal crown that rounds with age.

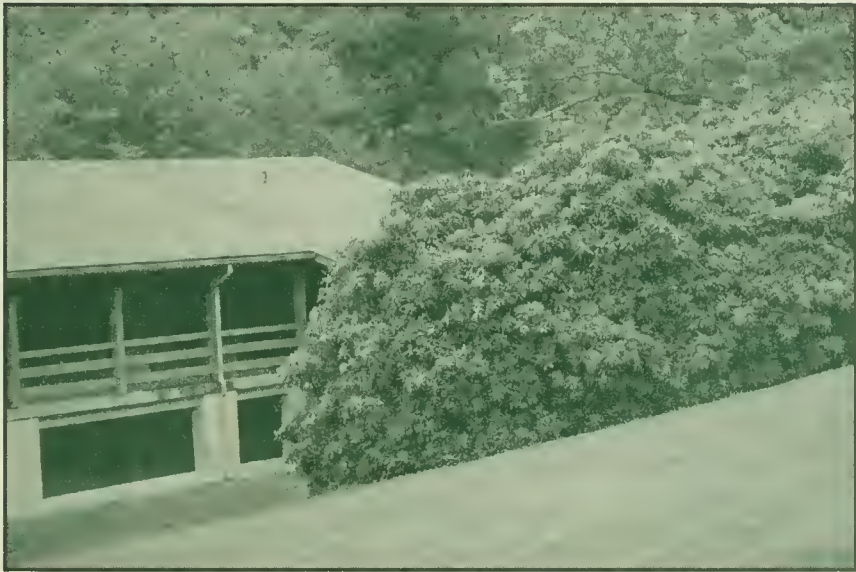




# BOTANIZING THE BLUE RIDGE



PHOTOS ON PAGES 3  
AND 6 BY SHERYL  
POLLOCK.



Peaks of Otter Lodge on the Blue Ridge Parkway



Onion Mountain Overlook

(Continued from page 1)

leaved sandwort (*Arenaria serpyllifolia*) grew among the stones, and in a tree an indigo bunting (*Passerina cyanea*) dallied long enough for a good picture. We had our first good look at the aptly named flame azalea (*Rhododendron calendulaceum*), and each shrub seemed to trump the previous with color change from yellow to orange to gold and back again.

Wednesday morning we went to Rake's Mill Pond to see Indian paintbrush (*Castilleja coccinea*). It turns out that it is the flower's bracts that are colored brilliant scarlet, and that the plant grows semiparasitically on the roots of other plants. In the afternoon we drove to Buffalo Mountain Natural Area Preserve where the Virginia Natural Heritage Program's chief biologist Chris Ludwig was our guide. Buffalo Mountain was the favorite of many. The hike up was the only uphill hike, but we paused so frequently to note the species' richness, that we didn't notice much strain. There were terrific views from the summit when the sun came out: Floyd, Caroline, and Grayson Counties of the Blue Ridge Plateau to the north, and the mountains of North Carolina to the south. Chris reminded us that much of what we were looking at was remnants of a northern plant population, and he emphasized the stress these plants endure from the wind, drought, and thin soil. We were all the more delighted then in the rock spikemoss (*Selaginella rupestris*), mountain sandwort (*Minwardia*

(See *Splendor*, page 6)



*Hybanthus concolor*, green violet



*Xerophyllum asphodeliodes*, turkey beard



# Know your VNPS Registry sites

One of the most important Virginia Native Plant Society programs is the designation of Registry sites. The primary requirement for eligibility is that a site have regional or state significance because of its native plants. Significant sites may exhibit an exemplary occurrence of a habitat, a plant community, or a plant species. Sites may include an unusual, persisting variation of a plant species, or an assemblage of species. Or the site may exhibit some quality with the unique potential to inspire community awareness.

No financial reward accompanies site registry. Landowners receive a plaque recognizing the valued effort of each participant in the Virginia Native Plant Registry. By registering special plant sites, participants stake a claim in Virginia's own natural resources and take the first step toward ensuring their protection. The benefits from the program are derived from a landowner's direct involvement in the protection of community resources. Along with the pride inspired by such an effort, landowners provide botanists with information that might otherwise be overlooked and that could lead to better protection of native plants.

A landowner forfeits no rights by voluntarily registering property as a Virginia Native Plant Society Registry Site. A landowner who later wishes to sell registered land or alter its land use is asked only to share these plans with the Virginia Native Plant Society. A landowner agrees to allow field botanists to visit the property on mutually agreeable occasions. The landowner continues to manage the site, but can benefit from expertise available through the VNPS. Although some of the sites are on public lands, the exact locations of others are confidential, and access requires notice or permission. Some sites can be opened to the public if the landowner so desires.

The VNPS directs this Registry through its Registry Committee. Committee co-chairs direct the review for

Virginia Native  
Plant Society

Registry Sites. What follows is a descriptive list of the unique ecosystems in Virginia that VNPS has designated as special by placement on its Registry. The general location of each area and the VNPS chapter instrumental in the registry designation are noted.

**Rosebay Rhododendron Community**  
*Altavista, Campbell Co., Blue Ridge Wildflower Society*

This unique ecological area at an elevation of 580-620 ft. includes a microclimate that has provided suitable growing conditions for several species of native plants that are not usually found in this part of the state. Century-old shrubs of *Rhododendron maximum*, rosebay rhododendron, which is usually found in the mountains, grow here along a creek. A proposed sewer line in Altavista would have destroyed much of the rhododendron site, but recognition as a VNPS Registry Site led to the choice of an alternate route. Among the disjunct species here are *Woodwardia aerolata*, netted chain fern, which is common on the Coastal Plain, and *Stenanthium gramineum*, featherbells, which is found mostly in the Alleghenies.

**Cahas Mountain**  
*Boones Mill, Franklin Co., Blue Ridge Wildflower Society*

Located on the highest mountain in Franklin County, these 100-plus forested acres contain a rich diversity of

plants, including a number of state-rare plants and plants that are disjunct from their normal range. Acres of early spring flora provide an outstanding display each year.

**Buffalo Creek Nature Area**  
*Campbell and Bedford Counties, Blue Ridge Wildflower Society*

Along Buffalo Creek, the Westvaco Corporation has preserved a unique hemlock forest, which does not usually occur at such a low elevation. In the spring a showy display of flora greets visitors to the nature trails, and an abundant variety of wildflowers can be seen throughout the year. The four trails that are open to visitors pass through six different plant communities.

**Bear Garden**

*Buckingham Co., Jefferson Chapter*

This family property includes a variety of habitats: alluvial woods and fields and bluffs with rock outcrops along the James River and Bear Garden Creek; floodplains, oak-hickory-pine woodlands, riparian wetlands, old fields in many stages of succession and a large pond. Once an active farm, it is now enjoyed for its rich diversity of plant life.

**Greenhaven**

*James City Co., John Clayton Chapter*  
Located in the York River watershed, this site with its deep ravine and buffering slopes is an example of calcareous ravine communities of the Coastal Plain of Virginia. The soils in these areas are high in calcium and other nutrients derived from the fossil shells in the substrate. This condition provides habitat for mountain-coastal disjuncts, plants that are primarily found in the western Piedmont and Mountain regions. The site is on private property and is not open to the public.

**Grove Creek Natural Area**

*James City Co., John Clayton Chapter*  
Located in Williamsburg adjoining Busch Gardens, this site is in an area of ravines and ridges formed by Grove Creek's cutting down into the Yorktown Formation. Pliocene marine deposits are

(See Registry Sites, page 5)



# •Registry Sites

(Continued from page 4)

found underlying the typical noncalcareous coastal plain sediments. It is the home of several rare plants and species at or near their northern limit or disjunct from their primary range. This habitat is threatened by the expansion of Busch Gardens and development.

## Calmes Neck Bluffs

Clarke Co., Piedmont Chapter

This site is the first listing with multiple ownership. It features bluffs, slopes and ravines along the Shenandoah River. The rich mesic forest is home to a spectacular diversity of spring wildflowers such as Virginia bluebells, *Mertensia virginica*, that carpet the forest floor. Throughout the season several rare and unusual plant species can be seen.

## Carter Run Wetland

Fauquier Co., Piedmont Chapter

This extensive wetland, with areas that are swampy year-round, contains a rich and diverse wetland flora dominated by native plants. Such areas are becoming rare as development increases. Registry emphasizes its value to the citizens of the county.

## G. Richard Thompson Wildlife Management Area

Fauquier Co., Piedmont Chapter

A portion of this area, which is managed for wildlife by the Virginia Department of Game and Inland Fisheries, contains an exceptional diversity of valuable native plants. A population here of *Trillium grandiflorum*, large-flowered white trillium, is the most outstanding in Virginia. The state endangered *Trillium cernuum*, nodding trillium, is also found here.

## Huntley Meadows, Riverbend

Park, Scott's Run Nature Preserve

Fairfax County, Potomack Chapter

These three highly visible sites are owned by the Fairfax County Park Authority. Their location in a highly populated area ensures frequent visitation and threats from development, highway construction and commercial interests. Site registry promotes awareness of the rich natural resources of the area.

## Runnymede Park

Town of Herndon, Potomack Chapter

This public park preserves and displays a diverse diabase community in the Triassic Basin of northern Virginia. Such communities are now rare in the area and, therefore, in need of conservation. Within its relatively small area, the park contains a remarkable variety of habitats with an unusually rich, intact and diverse flora that is representative of diabase soils.

## James Long Park

Prince William Co., Prince William

Wildflower Society

This county-owned park covers both wet meadow and upland forest plant communities. The area remains undeveloped and acts as a buffer to Catharpin Creek. Site registry emphasizes the importance of the area and encourages protection as encroaching development threatens habitat changes.

## Manassas National Battlefield Park

Prince William County, Prince

William Wildflower Society

The meadows and the floodplain provide a diverse display of native plants. Protection of this flora is dependent upon proper management of the area. Recognition as a VNPS Registry Site emphasizes the importance of protecting these species, many of which were present at the time of the Civil War battles. Thus, there is human as well as natural history significance to this site.

## Mueller Marsh/Folly Mills Creek

## Fen Natural Area

Augusta Co., Shenandoah Chapter

Mueller Marsh is a privately owned property that supports several acres of marshes and calcareous fens. It is the location of one of only two known populations of *Menyanthes trifoliata*, buckbean or bogbean, in Virginia. This and other disjunct and rare species have led to recognition of this area by the Virginia Natural Heritage Program. It is now part of the state system of Natural Area Preserves and has been renamed Folly Mills Creek Fen Natural Area.

## Great Falls Park

McLean, Potomack Chapter

This 800-acre park, owned by the National Park Service and managed by the George Washington Memorial Parkway, and is a popular outdoor spot. Vegetation includes upland and floodplain forest and rare veg-

etation communities on bedrock terraces, exposed rocks and frequently flooded Potomac River shores. One of the largest known examples of a state rare community is the Northern Piedmont/Lower New England Basic Seepage Swamp. Twenty-seven rare, threatened or endangered plant species in Virginia and several regionally rare plants are located here.

## Merrimac Farm

Prince William Co., Prince William

Wildflower Society

This site was registered for the large stand of Virginia bluebells and other spring wildflowers in the Cedar Run floodplain, and also for the upland forest community in the northern and western portions of the property. This forest is one of the best stands left in Prince William with high species diversity, low levels of deer browse, little human disturbance for 50-80 years and few invasive plants. A portion of the forest is classified as upland depressional forest, a fairly rare plant community type characterized by a perched water table and wet-tolerant species.

## Turkey Run Park

McLean, Potomack Chapter

This 700-acre park, owned by the National Park Service and managed by the George Washington Memorial Parkway, is considered the crown jewel of forested sites in the Potomac River Gorge. The forest is mostly mature with pockets of old growth. There are six forest community types many of which are ranked as state or globally rare including Beech/Sugar Maple Unglaciaded Basic Mesic Forest, Northern Piedmont Basic Low-Elevation Boulderfield Forest, Central Appalachian/Northern Piedmont Mixed Oak Bluff Forest, Northern Piedmont/Lower New England Basic Seepage Swamp and Mixed Bedrock Floodplain Rocky Bars and Shores. There are 20 state rare, threatened or endangered species in the park, including some species more common in the Appalachians.

## Arlington House Woodlands

Arlington, Potomack Chapter

This 12-acre National Park Service woodlands site, surrounded by Arlington National Cemetery retains its original historic purpose of providing a park setting for Arlington House,

(See *Rare places*, page 7)



# • Splendor

(Continued from page 3)

*groenlandica*), Michaux's saxifrage (*Saxifraga michauxii*), and my favorite, the silverling (*Paronychia argyrocoma*), a powder puff of silver.

The next day we drove to Rocky Mount, and there Chris took us to Bald Knob on the southeast side of the city. Despite the development stresses placed upon this area, the metabasalt with a southern exposure harbored a surprising diversity of plants. The mount, from which the city gets its name, has been recommended as a natural area preserve, and Chris is hopeful that it will receive such a dedication in a few years. His most exciting find there was a new fame flower (*Phemeranthus piedmontanus*). The plant has been described by Stuart Ware, of the College of William and Mary, and his write-up has just been published in the *Journal of the Botanical Research Institute of Texas*. Chris was invited to choose the species name, and he collected the type specimen from the very area where we were standing. Fame flower is another tough little plant growing in the rock cracks, which may be bone dry or puddled with water. From a basal rosette of tiny needlelike leaves, a hair-thin scape arises from which a single magenta flower blooms, opening shortly after noon and closing by the end of the day, presenting a narrow window for pollination. Another first for me at this site was curly heads (*Clematis ochroleuca*). This is the Piedmont Chapter flower, and I had never seen one.

After lunch we hiked up the Grassy Hill Natural Area Preserve on the northwest side of Rocky Mount. This is another ultramafic (high magnesium) plant community hosting a wide variety of plants and at least one relatively uncommon dragonfly, the gray petaltail (*Tachopteryx thoreyi*). A sharp pair of eyes found the endangered smooth coneflower (*Echinacea laevigata*) in a grassy clearing, which hosted a conference of box turtles as well. We found three of them there. We saw beautiful cucumber magnolia (*Magnolia acuminata*) and learned that sourwood (*Oxydendron arboreum*) is oval in its cross section. Then there was the unexpected find of some Canadian burnet (*Sanguisorba canadensis*). On the way back to the charming Hotel Floyd, we saw Buffalo Mountain at a distance, and then realized that it had been named for its profile, and not for some long-gone herd that grazed there.

On Friday morning we met naturalist and environmental historian Ralph Lutts and hiked up Rock Castle Creek. The trail was shaded and the greenery lush. It seemed like a secret place. Dr. Lutts showed us a pool, which is scoured by spring rains, but is quietly rebuilt each year by some unknown faithful who use it as a baptismal pool. He introduced us to stream piracy. Because of the steeper grade on the east side of the Blue Ridge, waters flow with greater force, and so there is more erosion as a stream cuts through the plateau. Streams can cut through to capture the waters of the streams that would ordinarily drain to the west. Later we visited a stone church that had huge quartz crystals embedded in the stonework. In the evening we enjoyed the authentic country music Floyd is known for. Butch and Betty could not have planned a nicer trip for us.

Marjorie Prochaska, VNPS Piedmont Chapter



*Chrysopilus thoracicus*, gold-backed snipe fly



*Aristolochia macrophylla*, Dutchman's pipe



# •Rare places

(Continued from page 5)

home to George Washington's grandson and later Robert E. Lee. Development pressure has removed an adjacent 12 acres, and it is hoped that the registry designation will call attention to this remaining forest. These Washington metropolitan woodlands have never been logged or tilled and contain many very large, old-age trees,

some dating to the American Revolution. Most of the area is on a variegated gravel, sand, silt and clay soil and a deep ravine with a perennial spring runs through the forest center. It is one of northern Virginia's surviving examples of Old-age Terrace Gravel Forest. The ravine forest canopy consists mainly of oaks, hickories, tulip tree and beech with an understory of fringetree,

witch-hazel, pinxter azalea, black haw and maple-leaved viburnum and a carpet of spring wildflowers.

## Caledon Natural Area at Caledon State Park

*King George Co., Fredericksburg Area Chapter*

Caledon State Park is owned by the Commonwealth of Virginia and managed by the Virginia Department of Conservation and Recreation. Although 800 acres is a National Natural History Landmark because of its undisturbed climax forests, the park designated a natural area in order to protect its bald eagle population. Because there was no specific intent to preserve the flora of the park, potential delisting of bald eagles in the future could lead to different management, and so it was felt that Registry status might protect the vegetation. The site includes forests of several types, both mesic and dry, as well as fields, beaches and wetlands. The oldest forests have trees over 150 years old in ravines. There is a wealth of native plants, with more than 500 species documented, and at least 18 species of rare or unusual plants.

# Getting dirty for a clean Bay

"Get your hands dirty and clean the Bay" is the motto of the Plant More Plants campaign launched in the spring by the Chesapeake Bay Program in partnership with a number of local governments and agencies including the Virginia Department of Conservation and Recreation. The Chesapeake Bay Program is a unique consortium that has led and directed the restoration of the Chesapeake Bay since 1983. Plant More Plants is the second personal stewardship campaign created by Bay program partners under the umbrella of the Chesapeake Club. The first campaign focused on the restoration of the blue crab population. Both campaigns strive to help homeowners learn about practices that will enhance

their quality of life as well as improve the quality of the Chesapeake Bay.

The program website, [www.plantmoreplants.com](http://www.plantmoreplants.com), offers tips on what to plant and how to plant and explains the benefits of adding plants to an area, such as diminished runoff, cleaner water, and the beauty that plants provide. The site also recommends using native plants as much as possible in order to provide a more balanced ecosystem and eliminate the need for fertilizers and pesticides that pollute the Bay. Supplier lists and recommended plants are included for easy reference. The site also explains why invasive non-native species are to be avoided. Tips on fertilizing, watering

(See *Plant More Plants*, page 8)

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# Virginia Flora racing in final heat

With the press deadline looming in late winter and publication barely more than a year away, work proceeds apace on the *Flora of Virginia*. Time is spent on final steps: another summit for *Flora* authors Chris Ludwig, Johnny Townsend, and Alan Weakley; checking those last few circumscriptions; tweaking the shape of needles on an illustration of a conifer; writing the remaining dichotomous keys; nailing down those needed plant measurements; and copyediting. While noses are to this grindstone, eyes nevertheless are open toward the premiere of this much-awaited book in the fall of 2012 and to the *Flora of Virginia* exhibition at the Library of Virginia, March–September 2014.

Chris Ludwig and I recently participated in a first meeting, organized by Laura McKay, manager of the Virginia Coastal Zone Management Program, of a Virginia Native Plant Communications and Marketing Partnership. Chris and I represented the *Flora* Project, and Chris represented the Virginia Natural Heritage Program. Other groups represented were the Virginia

Native Plant Society (Helen Hamilton sitting in for Jan Newton), the Virginia Department of Environmental Quality (including environmental educator and *Flora* Project board member Ann Regn), the Department of Conservation and Recreation, the Department of Game and Inland Fisheries, the Alliance for the Chesapeake Bay, and Wetlands Watch. This meeting was a first step allowing people from organizations dedicated to conserving Virginia's native plants to collaborate toward shared goals. The *Flora of Virginia* will be a conservation tool, and we're glad to be a part of this synergistic group.

*Bland Crowder, editor and associate director, Flora of Virginia Project*

## Volume dedicated to Shetler

One of North America's most respected botanists and a leader in the Virginia Native Plant Society, Stanwyn Gerald Shetler, will have Volume 18 of the *Flora of North America* dedicated to him. The honor comes in recognition of his contributions to North American botany and as a pioneer in developing the strategy in the 1960s for the *Flora of North America* Project. Over the years he has served as executive secretary and program director for the project. Shetler spent his career in the botany department of the Smithsonian Institution's National Museum of Natural History. He is widely published, but has also gained acclaim as a field trip leader, especially in the Washington region, where he has become an expert on the area's flora.

## • Plant More Plants

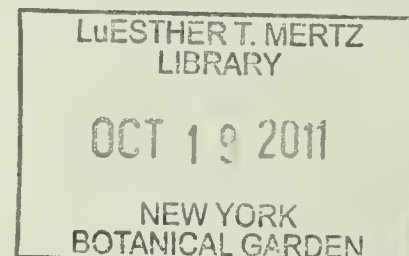
(Continued from page 7)

and mowing techniques that are less harmful to the Chesapeake Bay are included. Plant More Plants was funded through a grant from the National Fish and Wildlife Federation with matching funds from the Virginia Department of Conservation and Recreation. The public service campaign is targeting homeowners in the Baltimore, Richmond, Hampton Roads, and Washington regions.

To learn more, visit the Plant More Plants website or become a friend on Facebook at [www.facebook.com/plantmoreplants](http://www.facebook.com/plantmoreplants).

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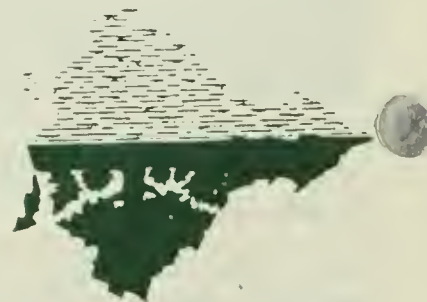


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# Bulletin

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Conserving wild flowers and wild places

<http://www.vnps.org>

## VNPS sponsoring shale barren rock cress with CPC

The current VNPS fundraising will support sponsorship of the shale barren rock cress, *Arabis serotina*, with the Center for Plant Conservation. The following information is taken from a study of the plant by M. Phillip Nott of the institute for Bird Populations for the Navy Information and Operations Command in Sugar Grove, W.Va. The entire paper may



Plants such as shale barren rock cress have adapted to the harsh, unforgiving habitat of shale barrens such as the one pictured here. (Photo courtesy Gary Fleming)

be read at [www.birdpop.org/downloaddocuments/SBRC\\_Nott\\_Review.pdf](http://www.birdpop.org/downloaddocuments/SBRC_Nott_Review.pdf).

The U.S. Fish and Wildlife Service first listed shale barren rock cress as a federally endangered species in 1989, when only 35 populations were known. It is currently designated as endangered throughout its range of four West Virginia counties and five Virginia counties.

The shale barrens where the plant typically occurs are on exposed southwest facing slopes of more than 20 degrees. In addition to shale barren rock cress, the typical vegetation occurring on these slopes includes those of the Virginia pine woodland in an elevation range of 517 to 792 m (1,700-2,600 feet). The average live plant cover of shale barrens is 5 to 40 percent, plant litter is 5 to 55 percent, and the soils are primarily shale fragments, known as channery. The temperature ranges from 55 to 60 C (131-140 F) during the hottest hours of summer.

(See Shale barrens, page 6)

## Virginia's barrier islands dynamic and complex

Though I became familiar with East Coast beaches such as Nags Head in North Carolina, Myrtle Beach in South Carolina, and Virginia Beach, long ago, I had never seen a pristine sand beach as found on a Virginia barrier island until I began field studies as a graduate student.

Sand barrier islands are located worldwide: the commonalities are river-delivered sand and isolation.

(See Barrier Islands, page 4)



Dead *Morella cerifera* stand in sharp contrast to living trees just behind them, a good example of ever-changing barrier island dynamics. The area where this *Morella* was growing eroded fast enough that the salt spray killed those trees closest to the ocean. (All photos by Stephen Johnson)

Annual Meeting photo album

Details about upcoming Florida trip

Page 3

Page 8





## From the president . . . . .

### Fall reveals nature's beautiful treasures

Fall, glorious fall. A little odd weatherwise, just like the rest of this year, but beautiful. On the Skyline Drive I came upon six or eight cars along the road. A bear, I assumed. But then I saw people lined up with cameras taking photos of a glowing yellow stand of tulip trees whose dark and not-quite-straight trunks stood in silhouette. A small miracle of light that might never be seen there again. The occasion was a meeting of the Shenandoah National Park's Adopt-an-Outcrop volunteers and a trip to the outcrop I monitor. We are a group of more than 20 who twice each year look in on the rare plants growing on rock outcrops in the park, a result of a study of these areas by Gary Fleming of the Virginia Natural Heritage Program and others.

In September we had a wonderful Annual Meeting, and I thank the Prince William Wildflower Society for a fine event, including the speakers, food and field trips, but best of all the good company. If you were not lucky enough to be there, you can still take a look at the program given by Karen Firehock of the Green Infrastructure Center on Saturday night by going to [www.gicinc.org/resources.htm](http://www.gicinc.org/resources.htm) or go through the link on the VNPS website (her other presentations are available as

well). She's got the right idea about how to save urban land and water by getting started ahead of time on mapping and reporting resources, and showing local governments the way forward. She has informational booklets and holds training events that some of you might find useful.

By the time we finished the annual meeting, I was being asked about the next one, and I'm pleased that the Pocahontas Chapter in Richmond will host the meeting that will celebrate our 30th year as an organization. Stay tuned for dates and details.

Soon the winter holiday season will be here, and I hope you'll think of VNPS when giving gifts. We still have T-shirts and notepads. For the person who doesn't need things, consider a gift membership or a donation to our annual fundraising efforts (shale barren rock cress sponsorship) in their honor. Also, the Potowmack Chapter has some gorgeous notecards for sale through the chapter or through the state office, and several chapters have books for sale.

I hope we can all get out and enjoy some evergreen native plants this winter, including our 2012 Wildflower of the Year, *Mitchella repens* (partridge-berry).

**Your President, Sally Anderson**

### 10 years in the making: Flora Project nears finish line

Something unexpected happened to me Saturday evening during the Annual Business Meeting portion of our VNPS weekend. I learned that the VNPS Board of Directors had decided to recognize my enthusiasm and efforts for our Flora of Virginia Project and had pledged to place a first edition copy of the *Flora of Virginia* in Simpson Library of my alma mater, the University of Mary Washington. The new manual of Virginia's flora will contain a bookplate with my name. This was a surprise and appreciated. Somewhat speechless, I could only muster a few words that included "Thank you."

The Flora Project is indeed an impressive undertaking as a scientific literary milestone for contemporary Virginians. Those of us who have helped for 10 years to publish this manual of flora descriptions with illustrations have been privileged to participate in any way we could to produce this volume. Virginia's botanists and naturalists have waited 250 years to replace the only existing, and now badly outdated *Flora Virginica* (1762)! Our contemporary botanists, Chris Ludwig, Johnny Townsend and Alan Weakley have proven to be up to the challenge and must be considered on the same stage with John Clayton, who with Gronovius in

The Netherlands produced the very first *Flora Virginica*!

Each of you who has generously donated financial aid has had a vital part in helping the *Flora of Virginia* be published by supporting the botanical work of our three authors. One special person leading the rest of us to support the project is Marion Lobstein who unrelentingly talked about the need and possibility of a *Flora of Virginia* for years prior to the actual 2001 start. She finally spoke to the right person, Chris Ludwig, who heard and agreed with her.

Until May 2012, there is still time to join the loyal subscribers of the Flora Project. A gift of \$1,000 to \$100,000 category will place your name with other leadership donors in the first edition of the *Flora 2012* and you will receive a complimentary copy of the *Flora of Virginia*. All donations are welcomed as we strive to complete funding of approximately \$85,000 to get our copy to the publisher. Other gifts could include the sponsorship of a plant family (\$4,000 per family and there are some waiting for sponsors). If you would like to know more about the Flora Project, please visit [www.floraofvirginia.org](http://www.floraofvirginia.org).

(See *Flora Project*, page 6)





## Wild Places in Urban Spaces

The Prince William Wildflower Society Chapter hosted the 2011 Annual Meeting of the Virginia Native Plant Society September 16-18, at the Four Points by Sheraton Hotel near the Bull Run Battlefield in Manassas.

VNPS members and friends gathered in Manassas to explore the varied flora and fauna in Virginia's only county that spans three geological provinces, from the Bull Run Mountain to the coastal plain on the Potomac River. Field trips explored historical and relatively new urban and rural wilds and wetlands, the botany and geology of Bull Run Mountain, the Occoquan Reservoir as seen from the water, the realities of building green, and regional winemaking at Silver Lake Winery. Around 100 attendees learned from featured speakers Jim McGlone and Karen Firehock about white oaks and forestry management in northern Virginia and how conservation contributes to wildlife management (and vice versa) and about some of the smart, creative ways urban and suburban neighborhoods are addressing land conservation and wildlife preservation and realizing the economic benefits of their efforts.



VNPS Annual Meeting photo album starting at bottom left and going clockwise: Jim MacGloue, of the Virginia Department of Forestry, stands beside a timber management sign; late blooming boneset (*Eupatorium serotinum*); Bethany Bezak and Linda Chaney talk about the rain garden plants and trails trails; Charles Smith stands in a meadow; smooth ground cherry (*Physalis subglabrata*); VNPS President Sally Anderson, left, honors Nicky Staunton for her work with the Virginia Flora Project; enjoying the view from Bull Run Mountain; three field trippers look at clammy cuphea; Indian pipe at Bull Run; Bethany Bezak of WS&S explains the roof garden filter system. (Photos by Jan Newton, Nicky Staunton, and Nancy Velirs)





# • Barrier Islands

(Continued from page 1)

Such islands are all along the East Coast of North America; those in Virginia are much like barrier islands farther north, not influenced by the warming of the Gulf Stream, which departs the east coast at Hatteras Island, North Carolina. Today these islands are uninhabited.

The principal islands in the 12-island, Nature Conservancy-owned Virginia barrier chain, used by ecological and geological scientists, are Hog and Parramore Islands located about half-way between Assateague Island (made famous by Marguerite Henry's book, *Misty of Chincoteague*) to the north and Fisherman Island at the mouth of the Chesapeake Bay to the south. The only access is by a boat winding its way through long and sinuous channels among miles of *spartina*-clad mud flats.

A barrier island is a complex and dynamic place with sand contours subject to often rapid change. The ocean-side beach is like any other seashore, but on these islands natural vegetation is allowed to grow wherever the proper habitats are available. It's splendidly isolated and you can hear the calls of shorebirds and crashing surf, and walk in a habitat described by the first English explorers to come here about 460 years ago.

My colleagues and I ventured to the north end of Hog Island hoping to arrive at high tide so that we could unload the boat directly onto the Machipongo Station dock, named for the Nassawodoc Indian word for

"dusty place." It was the last of the Virginia barrier island lifesaving stations and is now used by researchers from Virginia Commonwealth University, the University of Virginia and Old Dominion University. If we missed high tide we'd have to take hundreds of pounds of gear through ten yards of boot-sucking marsh muck!

After traveling through miles of low salt marsh dominated by saltmarsh cordgrass (*Spartina alterniflora*), the first difference you see is the high saltmarsh dominated by salt meadow hay (*Spartina patens*). Salt meadow hay has a long association with people. Inhabitants of barrier islands once used it as animal forage. Today it is used as mulch by gardeners in the northeastern states. Salt meadow hay is not as hard to navigate through as saltmarsh cordgrass, so here you may be lucky enough to spot colors provided by high marsh wildflowers. We arrived in May when sea lavender (*Limnium carolinianum*) was in flower. Sea lavender is sometimes available in nurseries and flower shops all the way to the midwestern states, but observing it in natural conditions was most gratifying. Once I was lucky enough to spot a single flowering stem of maritime gerardia (*Agalinis maritima*), a hemiparasitic species attached to the roots of the surrounding salt meadow hay.

Here your attention can quickly be diverted by acute pain—from an attack by a green head horsefly. I chuckle now, but I can certainly sympathize with the response the first English explorers and settlers must have had to these biting flies. Such vicious flies certainly impressed John White, artist and early explorer who painted the insect and called it "a dangerous byting flye." The impressive 3/4 in (19 mm) "green-heads" have eyes that look like green aviator sunglasses. They land on top of your head, carve a bowl out of your scalp with their jaws and lap up the pooling blood. The attack will certainly interrupt a wildflower reverie.

Behind the high saltmarsh are towering shrubs of the spicily scented wax-myrtle (*Morella cerifera*), the woody aster called groundsel tree



View atop Machipongo Station at the northwest corner of the island.

(*Baccharis halimifolia*) and marsh elder (*Iva frutescens*). Hidden among the wax-myrtles was my study goal, the loblolly pine (*Pinus taeda*). I had to hack through yards of wax-myrtle with a machete to get to every tree, a sweaty endeavor guaranteed to draw thousands of frightfully large bloodsuckers known as salt marsh mosquitoes.

Behind Machipongo Station is a jeep trail to the beach. Here you walk through time toward the ocean. The first dunes you encounter may be well over 100 years old. Next, you walk through a wide, wet and heavily vegetated depression called a swale to a younger dune perhaps 50 years old and then through a younger, less heavily vegetated swale until you reach the foredune, likely formed less than 25 years ago. The older dunes, called backdunes, and the older swales are monopolized by wax-myrtle growing so densely that no light reaches the ground. Younger backdunes, not so well covered, have prairie-like communities with a variety of wildflowers and grasses. One grass you will quickly get to know—due to its spiny fruits that catch your socks and drill their way into your flesh—is the sandbur (*Cenchrus tribuloides*). A wispy and almost shadow-less plant is three-awn grass (*Aristida tuberculosa*). Its long awns, resembling cat whiskers, are arranged (See *Sand dune dynamics*, page 5)



*Sabatia* is one of the prettiest dune/swale plants. *Sabatia stellaris* is shown here with a common swale sedge, *Fimbristylis castanea*.



# 'Seeing Trees' book a must have

[*Seeing Trees: Discover the Extraordinary Secrets of Everyday Trees*, by Nancy Ross Hugo and Robert Llewellyn, Timber Press 2011. \$29.95]

"You mean trees have flowers?"

We've all gotten that reaction from a botanically-challenged acquaintance. Nancy Ross Hugo's new book will show even the most botanically aware that a whole world of unusual and beautiful structures exists in our familiar trees. Nancy's first tree book (also with photographer Robert Llewellyn), *Remarkable Trees of Virginia*, is an homage to trees that are remarkable for their growth forms, their surroundings, their human associations. *Seeing Trees* could well be subtitled "remarkable things you'll see if you look closely at familiar trees."

The photos by Robert Llewellyn of bark, buds, flowers, emerging leaves and other structures are magnified, filling the pages with unbelievable detail, going beyond illustration into art. Nancy's

easy-going prose complements the photos seamlessly. You'd have to climb a tree to get this level of detail, and after seeing this book, you'll probably want to.

I was happy to glean a bit of good news for my own trees. Whenever I've seen flowers appearing on the trunks of my redbuds, I suspected some pathology and impending death, but not so! It's just cauliflory—stem flowers—a characteristic more common in the tropical rainforests, but quite acceptable in redbuds. There's another bit of fun in here about the redbud flower, but I'll let you find it.

*Seeing Trees* shows many things in all seasons, but the one that has my attention now is four pages of twigs and buds. After the frothy bloom of spring and the color burst of fall, what we're left with may be the most interesting structures of all, where those blooms and bursts are stored for next year. Winter botany, twigs and buds, is a wonderful study, and our Shenan-



doah Valley Chapter is planning a walk in January, specifically to sample this bounty.

Meanwhile, pick up a copy of *Seeing Trees* and expand your view of things arboreal—and keep it on hand for the next time you have to prove that, yes, trees have flowers, and a whole lot more. (Mark Gatewood, Shenandoah Chapter)

## • Sand dune dynamics

(Continued from page 4)

like the blades of tiny windmills. While the grasses aren't showy, they may bite you!

Here grow some of the most beautiful seaside wildflowers such as the open, pale yellow, bowl flowers of seaside primrose (*Oenothera humifusa*). Unlike the tall forms of inland primroses, this species is recumbent, hiding among the sandburs and three-awns. The forbidding and inadequately named yellow thistle (*Cirsium horridulum*) sits like a crowned citadel of vegetal broken glass, knives and needles with lower leaves exerting physical pressure on and killing anything growing nearby. An aesthetic counterpoint to yellow thistle is the velvet-leaved beach ground cherry (*Physalis viscosa* ssp. *maritima*) a state-level threatened species with hidden yellow, pendulous flowers. Swaths of the vining and prostrate beach pea (*Strophostyles helvola*) spread over other areas of backdune. Covered in small pink flowers, this vine can act as quite a functional trip cord.

The beautiful sea pink (*Sabatia stellaris*) looks like few flowers on the mainland. I was fascinated by how the canary yellow base of the petals is separated from the major pink extent of petal by a thin red zigzag line appearing as if on the spacesuit of Flash Gordon. Another beautiful pink flower, purple false foxglove (*Agalinis purpurea*), is rare and found in freshwater marsh swales, growing parasitically with host plants such as big-headed rush (*Juncus megacephalus*).

In the youngest swales, fresh water from rainfall accumulates and attracts some rare species for Virginia. Most of the wetlands are quickly colonized by graminoids such as squarestem spikerush (*Eleocharis quadrangulata*), blunt spikerush (*E. obtusa*), giant bulrush (*Scirpus validus*), chestnut sedge (*Fimbristylis castanea*) and, in drier areas, running beach grass (*Panicum amarum*). There are some diminutive, prostrate plants such as succulent-leaved marsh hyssop (*Bacopa mounieri*), a threatened species in Virginia prized in India's traditional medical practices. Another spreading and re-

cumbent plant is common frog fruit (*Lippia nodiflora*), which grows far south into the tropics. A rare pink flower is the stinking saltmarsh fleabane that goes by the scientific name of *Pluchea foetida*, making it sound adorably disgusting! Sadly, the diversity of this habitat is fading fast with the colonization and rapid takeover by common reed (*Phragmites australis*).

Where the foredune is breached, the swale becomes salty or sand-covered in what are called overwashes. This is the most likely spot to find glassworts, the most common being annual glasswort (*Salicornia bigelovii*). In my peregrinations I would come upon a large mass of blood-red annual glasswort; its succulence reminded me of the "red weed" from H.G. Well's *War of the Worlds*.

The foredune itself, facing constant salt spray and rising well above the water table, is a sparsely vegetated zone but one typically stabilized by American beach grass (*Ammophila breviligulata*). This grass is one of the only stabilizing influences for the developing foredune and is the focal point of female diamondback terrapins looking for a place (See *Constant change*, page 6)



## •Constant change

(Continued from page 5)

to nest. Yet even in front of the foredune is a small guild of stalwart, salt-tolerant plants. The most bizarre is sea rocket (*Cakile edentula*) with fruits containing two types of seed-dispersal mechanisms. Growing from the foredune to the high tide line is the diminutive, mat-forming seaside spurge (*Euphorbia polygonifolia*). On a beach similar to this one Henry David Thoreau observed this same species, recording it in his book *Cape Cod*.

I also botanized southward on Hog Island walking on the thin and spongy ecotone between high salt-marsh and shrub zone usually finding enough sure footing on rooted sand. Along the way I passed sea oxeye (*Borrichia frutescens*) and used my thumb to assess the sharpness of the erect bract of the black needlerush (*Juncus roemarianus*). While doing this, I spotted an opening in the shrub zone and hacked my way to it. I found a tiny grove of large and probably old toothache trees (*Zanthoxylum clava-herculis*) all surrounding an immense, ancient Native American oyster shell midden. Radford, Ahles and Bell in *Flora of the Carolinas* say that this is the most likely

place to find the toothache trees on the coastal plain. In the Carolinas, Native Americans and early settlers used the bark of the tree medicinally to treat, among other things, toothaches.

In the 19th and early 20th centuries Hog Island boasted a large maritime forest, located primarily at its south end, composed of loblolly pine and perhaps other trees. After the East Coast hurricane of 1933, the south end of Hog Island began eroding apace. Fifty years later, the island's maritime forest had fallen into the sea. The town of Broadwater can be found by scuba divers two miles offshore.

I visited Parramore Island just twice. Parramore is the island immediately north of Hog and once supported a large maritime forest. I was lucky enough to be in this forest and see among the thick pine duff a single, but robust, pink lady-slipper (*Cypripedium acaule*) and the sky blue flowers of wild ageratum (*Eupatorium coelestinum*). I also discovered a record for the Virginia Barrier Island flora when I found a single clump of the mycotropic Indian pipe *Monotropa uniflora*, that look like a handful of un-striped candy canes. Within five years of my visit this loblolly pine forest was attacked and mostly killed by the southern pine bark beetle.

Ten years later it burned to the ground from a lightning strike; the nice clean understory of ladyslippers must by now be a developing thicket of wax-myrtle.

But these islands will forge on, as long as new sand is delivered by river outflow. Hog Island in the early to mid-1990s was forming new sandbars in the north. This early stage of beach building might eventually lead to the formation of the next foredune. Already the swales where marsh hyssop grew were being rapidly colonized by wax-myrtle. To the south I saw salt-killed wax-myrtle where the eroding beach brought saltwater too close. The rapidity and relentlessness of change is especially clear on Wreck Island. Twenty years ago, the island's foredune was rapidly progressing over marsh and into flowering prickly pear cactus (*Opuntia compressa*). New sand was colonized by quickly growing rhizomes of saltgrass (*Distichlis spicata*). Today, Wreck Island has lost two miles of its north end. As long as sand is provided in amounts greater than it is taken away by erosion from wind and waves, the islands will remain but in a state of constant change.

*This article was originally published in the North American Native Plant Society newsletter, The Blazing Star, www.nanps.org. Stephen Johnson is a freelance ecologist and botanist originally from Virginia, where he studied the effects of salt stress on loblolly pine on the Virginia Barrier Islands for his Ph.D. at Virginia Commonwealth University.*

## •Shale barrens

(Continued from page 1)

In 1991, the USFWS Northeast Region prepared a recovery plan that outlined actions needed to protect or recover the plant, which included: a) seeking protection of all extant populations and securing permanent protection for self-maintaining populations and their habitat; b) monitoring extant populations; c) searching for additional populations; d) conducting ecological and life history studies; e) storing seeds; and f) developing and implementing management plans for extant populations as needed.

Downlisting from endangered to threatened, or delisting, would be suitable when a critical number of self-maintaining populations and their habitats are permanently protected. The rarity of the plant compared to the suitable shale barren habitat suggests that reproduction problems may exist, that herbivory is limiting population

increase, that disturbances have extirpated populations and their seed banks, and that perhaps dispersal problems prohibit recruitment.

Two major threats to successful pollination are herbivory of inflorescences and a lack of pollinators. Without cross-pollination, isolated populations could show high levels of inbreeding depression, reducing seed viability and germination percentage.

The grizzled skipper (*Pyrgus wyandot*) is a known pollinator and has experienced dramatic declines in recent decades. In Michigan, a decline was attributed to collateral ecological damage caused by widespread spraying of Dimilin and other pesticides to control the gypsy moth (*Limantria dispar*). The grizzled skipper is found in habitats including shale barrens, pastures and powerline corridors on south- to west-facing shale slopes. Shale barrens have large gaps where

(See *Species threats*, page 7)

## Flora Project

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Thank you for honoring the Flora Project's effort. The *Flora of Virginia* is the bright star rising on Virginia's botanical horizon! The expected release date is October 2012. Bland Crowder is busy copy editing text to send to our publisher, Botanical Research Institute of Texas, in March 2012. Before much longer there will be a way to preorder copies of the *Flora*. Stay tuned.

Huzzah for the Flora of Virginia Project Team! Huzzah for you and your support!

(Nicky Staunton, VNPS Vice President and representative on the Flora of Virginia Project Foundation Board)



# •Species threats

(Continued from page 6)

the adults forage and lay their eggs. The tented caterpillars feed exclusively on Canada cinquefoil (*Potentilla canadensis*) plants. Unfortunately the skipper has been almost eradicated from previously known locations. Other observed pollinators include bees of the genera *Apis*, *Halictus*, and *Adrena*, which are not affected by Dimilin, as well as syrphid flies.

The report recommends that any pesticides used to control the gypsy moth, or any other forest pest, be carefully assessed as to its impact on other invertebrates. It also recommends that current management practices of roadsides, trails, and pipeline/powerline corridors near shale barrens and where cinquefoil grows abundantly should be reviewed to maintain abundant cinquefoil cover and nectar plants for grizzled skippers.

Invasive species can often outcompete native species for areas to germinate. Many invasive plant species that specialize in colonizing disturbed areas are distasteful to native herbivores, allelopathic to native plant species and produce

many seeds. Three widespread invasive species threaten the shale barrens. Spotted knapweed (*Centaurea maculata*) is a weedy perennial that inhibits the growth of other plants. It is spread by foot traffic, cattle grazing and the transport of hay. Barren brome (*Bromus sterilis*/*Anisantha sterilis*) is an invasive grass that can be spread by humans, wild animals, hay transport and horse droppings.

Deer, goats, sheep, and lepidopteran larvae may be responsible for herbivory of shale barren rock cress. Deer have been reported to destroy up to 70 percent of inflorescences. Springtime grazing of terminal buds may increase branching and hence seed production, but late summer grazing might reduce the number of seeds. The degree of herbivory by lepidopteran larvae in a study within deer exclosures was notable, and whites and sulfurs (*Pieris* sp.) and the Olympic marble (*Euchloe olympia*) were observed. It was also suggested that other herbivores might be involved.

Historically, shale barren rock cress is thought to have been widespread, but dam, road, track, and trail construction associated with European settlement caused destruction and overall loss of shale barren habi-

tat. It is recommended that the environmental impact of land use changes near shale barrens should not alter the physical, physiological, hydrochemical or geochemical properties of the habitat. This would include: a) affecting the course or flow of streams that commonly undercut the barrens; b) altering the runoff/drainage flow into or out of shale barrens, thereby changing soil moisture patterns; c) altering the hydrochemistry of shale barrens by introducing chemicals (e.g. pesticides, herbicides and road or agricultural runoff); d) impeding or increasing the ability of scree to move downslope; e) managing adjacent lands in such a way (e.g. establishing new trails and powerline corridors) as to increase the chance of introducing invasive plant species; or f) physically impacting the shale barren by allowing human or animal movement, thereby disturbing the physical nature of the barren, increasing herbivory, and potentially dispersing seeds or propagules of invasive plants. The impact of field researchers should also be minimized.

Restoration may include restoring natural drainage patterns where the drainage has been diverted. To (See *Looking to the future*, page 8)

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## Explore Florida Panhandle with VNPS

A week-long VNPS trip to the Florida Panhandle is planned for March 25-31, 2012. Trip highlights are expected to include visits to Florida Caverns, Angus Gholson Park, several sites in the vicinity of Torreya State Park, stops in the Appalachian National Forest, a boat tour of the Appalachian Basin (limit 13, first-come, first-served), and a guided trip to a dune habitat on St. George Island. We expect to see trilliums, flowering shrubs, carnivorous plants, a dwarf cypress forest, and a multitude of other plants. The cost of the trip will include lodging, lunches, guides and admission fees. Trip costs are not yet finalized, but should be in line with previous VNPS trips.

There is a 16-person limit for the trip. To reserve a place, send a deposit of \$100 to the VNPS office [VNPS Florida Trip, 400 Blandy Farm Lane #2, Boyce, VA 22620]. Signups will be in the order in which deposit checks are received.

If you are interested but not ready to commit, put your name on the waiting list by sending your contact information, with an email address if possible, and more details will be provided when they become available.

## Looking to the future

(Continued from page 7)

minimize destruction and invasive plant impacts, tracks, trails, or other corridors should be rerouted or closed. Parking lots and horse camps should not be located in the vicinity of shale barrens, and current non-native cover should be eradicated. To encourage cross-pollination and decrease inbreeding depression, grizzled skippers should be restored to those shale barrens from which they were extirpated. Pesticide use to control gypsy moth should not be permitted near shale barrens.

To maintain the genetic diversity of this species, seeds should be collected, genetically typed, and when extremely rare grown to maturity in greenhouses to harvest sufficient numbers of selfed seeds for storage and possible cross-pollination.

(This article was abridged from: *Shale Barren Rock Cress (Arabis serotina): A Literature Review and Analysis of Vegetation Data. A Report to the Navy Information and Operation Command, Sugar Grove, West Virginia and Naval Facilities Engineering Command Atlantic and the Institute for Bird Populations prepared by M. Philip Nott, Ph.D., Nov. 30, 2006.*)

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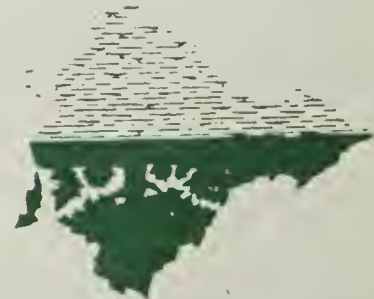


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